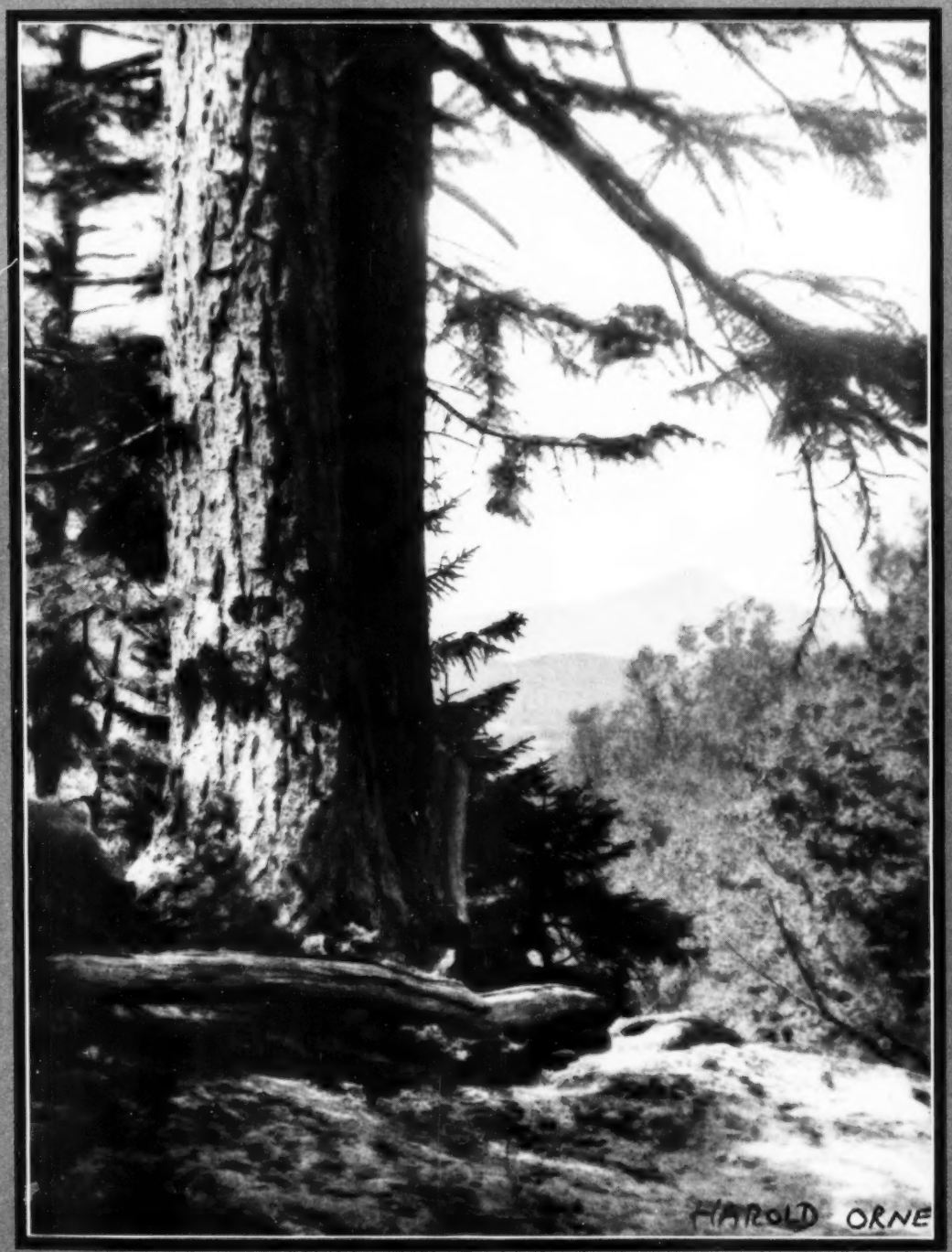
American FORESTS



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OVID BUTLER, Editor
L. M. CROMELIN and ERLE KAUFFMAN, Assistant Editors

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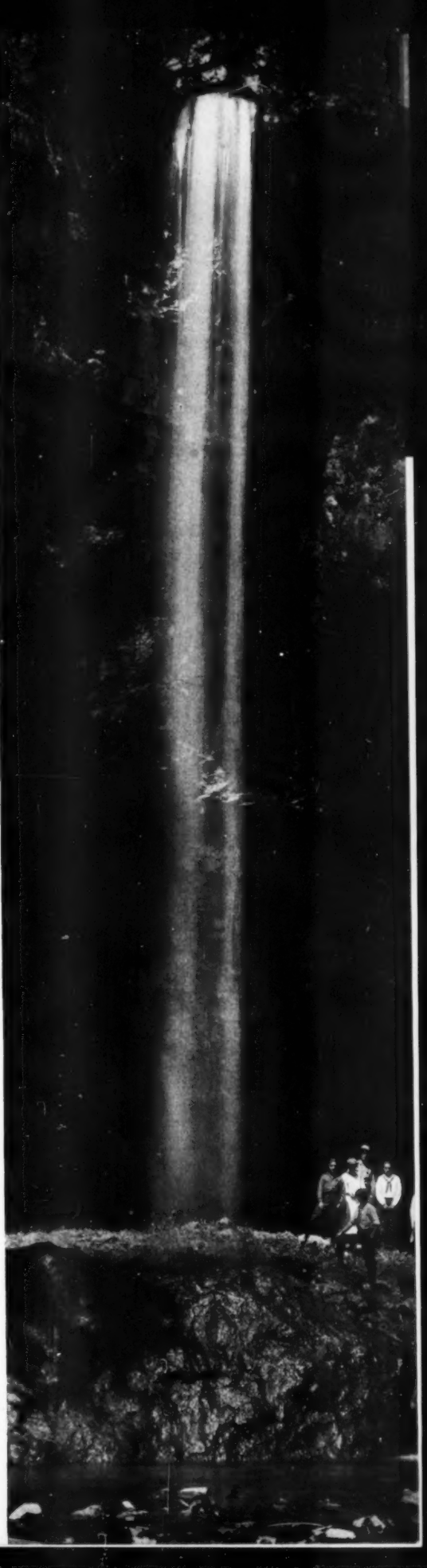
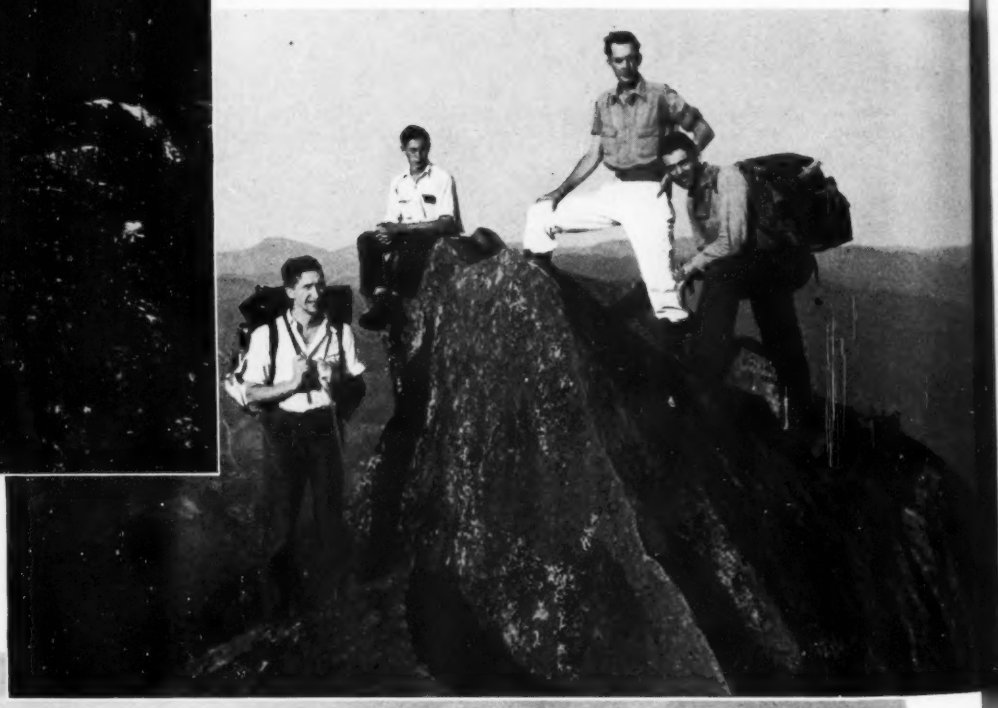


White Rock, with an elevation of 5,025 feet, is the first peak at the Northeast end of the Great Smoky Mountains National Park. Our wilderness hike started from the State highway, which skirts the National Park at an elevation of 2,000 feet. White Rock stands out in bold relief from this point.

The rocky crest of White Rock affords spectacular views in all directions. Here the hiker in the Great Smokies is thrilled by a panorama including the whole 360 degrees of the compass. In the picture, reading from left to right, are seen Harvey Broome, Herrick Brown, Charles Gibson and Walter M. Berry.

It's two days of hard hiking to Mt. Guyot, in the right background. Jagged White Rock is in the immediate foreground. Troublesome Hell Ridge extends diagonally to the right background. The Tennessee-North Carolina State line follows this high crest, which is also the route of the Appalachian Trail.



Photographs by A. G. Roth

CONQUERING THE CREST OF THE GREAT SMOKIES

NINE INDOMITABLE HIKERS FIRST TO TRAVERSE ENTIRE MAIN CREST OF GREAT SMOKY MOUNTAINS NATIONAL PARK

By CARLOS C. CAMPBELL

UP TO 1932 very few hikers seriously considered traversing the entire main crest of the Great Smoky Mountains National Park in a single trip. The odds against success were too great—odds which mounted with successive failures. Anyone who had sampled even for a day the untrailed way along the high crest, had challenged its ruggedness, had battled its jungle-like undergrowth, all the while faced with the serious, sometimes desperate, problem of maintaining a water supply, knew the extent of these odds. Consequently, the inclination was to look upon such a venture as foolhardy at best.

We knew this. We knew also that grim failure had overtaken the only two parties within our knowledge to attempt the conquest. We had seen exhaustion written deeply in

Walter M. Berry

Mt. Guyot, in the background, seemed to recede while Deep Creek, at our left, was much more inviting because of the intense thirst we suffered. Reading from left to right are Warner W. Hall, Charles Gibson, Carlos C. Campbell and Carter Whittaker.

Walter M. Berry

It is a sheer drop from here down to the headwaters of Bradley Fork. The view into North Carolina at this spot is a counterpart of the spectacular look into Tennessee from Eagle Rocks.

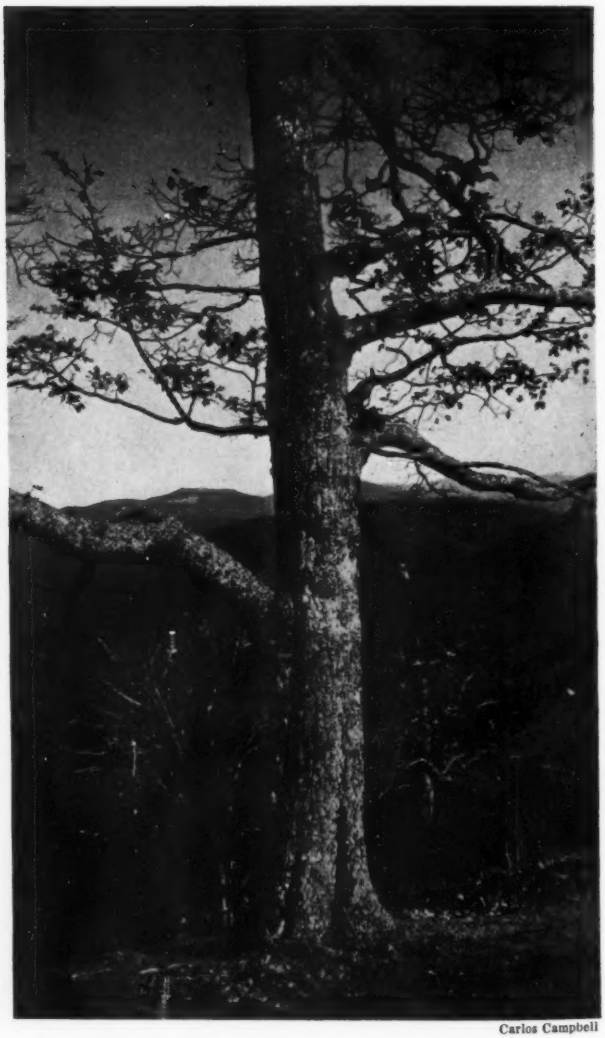
the faces of those who tried it; we had looked with some strange emotion upon their clothing, torn to shreds by the unyielding undergrowth of rhododendron and mountain laurel; we had listened to their tales of chilling mid-summer rain, and sleet that lay two inches deep on the ground. But for some reason we were not dismayed. The challenge of those failures could not be ignored. It made us more determined than ever to conquer the crest of the Smokies.

There were nine of us, all members of the Smoky Mountains Hiking Club, and we gave ourselves eight days in which to cover the thirty-eight miles to Newfound Gap, 5,045 feet above sea level, and our announced destination. Among ourselves, however, we cherished a secret hope that we would get through to Deal's Gap, eighty miles distant. Eighty miles in eight days—ten miles a day. A moderate pace for experienced hikers; but as any mountain man knows, a mere statement of mileage means little where the dim-trailed way is concerned. The nature of the terrain is vastly more significant; so is the presence of water, or the lack of it. The weather plays a hand, and so does luck.

Needless to say, our plans were carefully made. Particularly did we give serious attention to our packs, for the weight of these might well spell the difference between success or failure. After much effort we managed to hold them down to about sixty pounds each. Food and general equipment were apportioned equally as to weight and bulk, and so arranged that one man would pack, say, all the bacon, another man the dehydrated foods, and so on around. As a substitute for water we included a quantity of canned goods, for those who have fought their way along the crest of the Smokies know the difficulty in descending its gorges far enough to find this precious fluid.

So when we set out one Sunday morning in August it was with the feeling that we were organized to succeed; our fate now rested in the hands of the elements and upon our own pack-burdened shoulders.

Our send-off was a memorable one. Other members of the Club accompanied us as far as White Rock, the first peak on our route, as a special tribute to our ambitions. But this honor nearly ruined us. Our escort, without packs, set a



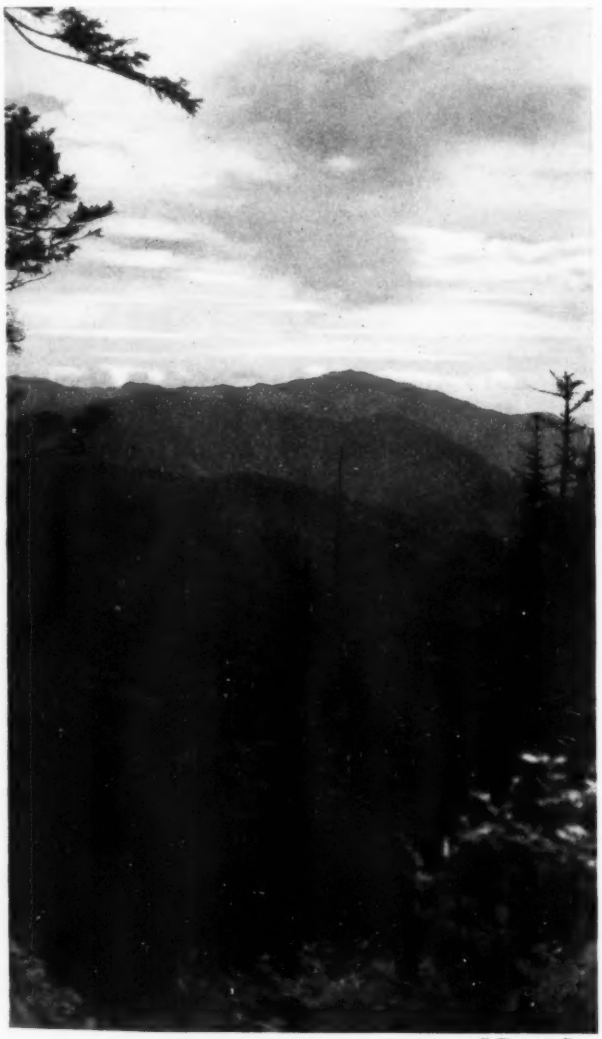
Carlos Campbell

Giant Oak, at Rich Gap on state line about one-half a mile east of Gregory Bald. Thunderhead is seen in the background, just left of the tree. All these points are on the 2,000-mile Appalachian Trail, in the Southwestern portion of the Great Smoky Mountains National Park.

pace that we attempted to follow and, as a result, after an hour of hiking, and with White Rock still 2,500 feet above us, we began to lag behind. Finally, we found ourselves disposing of certain personal belongings to lighten our load, and I am frank to admit that at one time I was so completely whipped that I would have turned back but for the fact that those ahead of me were depending upon food that was in my pack. There were others, too, who felt much the same way about it.

We made it, though, after a long session with the scorching afternoon sun. But we didn't feel much like conquerors. The torture of that climb had subdued our enthusiasm. Yet, as we watched the evening shadows lengthen from our 5,000-foot perch, as we looked at that 360 degree panorama, we felt well repaid for our day's ordeal. Give up the trip? Never! We were conquerors again! The Smokies had challenged, and we, nine strong, had accepted! Forward!

From White Rock our route was to follow the Appalachian Trail—a continuous foot-way along the crest of the Appalachian Mountains from Maine to Georgia. The eighty miles of jagged state-line crest through the Great Smokies is the roughest and highest portion of this 2,000-mile trail, and is one of the few sections where much of the way was still in a wilderness condition. The National Park Service, however, is now building a modern trail, four feet wide, along this route.



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Mt. LeConte, seen from Mt. Chapman, in the heart of the section set apart to be held as a wilderness area. Only such trails as are necessary for fire protection are being built.

A. G. Roth

A setting sun gave the finishing touches to this masterpiece. This view from near Low Gap is typical of the beauty of sunsets—and sunrises—in the Great Smokies.

We had expected to reach Low Gap, three miles to the west, for our first camp, but darkness beat us to it. As a consequence we spent our first night on the ground a mile short of our goal. We had breakfast there Monday morning, however, filled our canteens and canvas water bag, and turned into a fairly good trail. But that trail did not serve us far. Soon we were fighting our way laboriously through a maze of rhododendron and laurel. For good measure there were a few saw-briers interspersed. Sometimes we were on the state-line ridge crest; at other times we found better going on the Tennessee side. But it was slow travel no matter where we went—and rough. Our packs were continually hanging on the underbrush; sometimes it was our clothing.

We pushed on until darkness was an hour away, hoping against hope for a suitable campsite. Apparently none existed, so we staked our tents in the wilderness, away from water, away from comfort, away from everything but rhododendron. To conserve our scant supply of water, we warmed canned goods before a small fire. Then we turned in, but not until we had discussed our plans for the next day. They were vague, for the country ahead was unknown to us. But one thing was certain, we must find water. Already this problem was causing us great concern.

There was nothing to induce us to linger the next morning, so we made an early start. Soon we were out of the maze, and into an open area caused by the lumberman's ax, and the fire that had followed. We paused for a moment to get our bearings, now that we could see something more than rhododendron, and found the view intriguing. Mt. too, that had we succeeded in reaching it many strong arguments would have been advanced for abandoning our conquest. Once off that sun-baked ridge, and with our enthusiasm at a low ebb, it would have been extremely difficult to return. So we decided to push on, staking our chances on reaching Mt. Guyot and its fine spring.

It was time for lunch, but what we wanted was water, not food. And we knew that we would not find it on the burned-over side. So we swung over to the steeper, but tree-clad, Tennessee slope. There was a chance we would find water there—a very slim chance. At first the prospects were discouraging; the soil was bone dry. But later we found slight traces of moisture under the leaves. Hope sprang up again.

Every canteen was now empty, and the situation was desperate. "I'm going down for water!" was the sudden announcement of the youngest member of the group. I wanted

Walter M. Berry

The Great Smoky Mountains National Park lures the lover of lofty places. This vista through the trees shows the Tennessee side of the Park from the State line between Thunderhead and Gregory Bald.

Sterling was to the south, across the gorge of Big Creek, and was an impressive sight. Better still was Big Creek itself, for we could see its water. To the west loomed Mt. Guyot, the objective we had hoped to reach the night before.

Blackberries and huckleberries were plentiful, and so were bear signs. We did not see one, but we knew they had been around. Bears do like berries!

The sun shone down upon us with a vengeance. Not a cloud was in the sky. Nor were there trees to shade us occasionally—only charred remains over which we were forced to climb. This was on the North Carolina side, so we tried Tennessee, where a virgin forest still graced the slopes. But it was too steep, and the trees and undergrowth too thick. We returned to the blistering open spaces to plod wearily along.

By careful use of water we still had a pint or so between us. But something had to be done. We considered descending to Big Creek, in plain view below us, but we knew that it would involve a hard half-day's trip. I rather suspect, water just as badly as he, but I was well-nigh exhausted, and needed rest even before water. So we let him go, first throwing the water bag over his shoulder.

There was nothing for the rest of us to do but wait—and hope. Canned kraut and grapefruit were opened; our throats were too parched for anything else. The slight relief more than justified the added weight of the canned goods.

We continually called to the searcher below, but not a sound came back. Minutes seemed hours. Finally our throats became so dry we could no longer call. Then we heard it, an indistinct call from below. We answered as loudly as our dry throats would permit, seeking to guide our companion back to where we waited with mixed feelings of hope and despair. Much sooner than we expected he came into view, a smile on his face and—we felt like cheering—the water bag slung over his shoulder—full.

Our thirst quenched, we proceeded along the remainder of that desolate waste. Its name, Hell Ridge, described it adequately. Even the cut-over (*Continuing on page* 299)

DO EAGLES STEAL CHILDREN?

A LEGENDARY BELIEF, HELD BY MANY EVEN TODAY, IS WEIGHED IN THE LIGHT OF EVIDENCE

By

ALEXANDER SPRUNT, JR.

DOWN through the centuries has come the somewhat haunting and terrifying idea that eagles carry off young children. In fact, as late as 1931 a Finnish farmer reported the finding of the skeleton of his two-year-old child in an eagle's nest near the Russian frontier. The incident, no doubt, given publicity in the press of the world, caused grave concern in the hearts of parents and subjected thousands of children to unnatural restrictions in regions known to be inhabited by these regal birds of prey.

Were these fears, these restrictions justified? Do eagles really carry off children? Despite age-old beliefs and seemingly positive proof, are these royal birds actually guilty of child stealing, the world's most heinous crime?

I am not so sanguine that I hope to answer a question which has puzzled the minds of many generations. But at least I can set forth certain facts in defense of these great birds and point rather conclusively to the circumstantial nature of the evidence against them.

To begin with, I have never seen an eagle attack a human being, although I have lived in a country where there are many eagles. I have studied them, investigated their nests, watched them exact their tribute from lesser bird life. But I have never seen one point its talons in the direction of a human being. Ornithologists in general, men who have given much time to the study of eagles, have had the same experience, and the idea of an eagle carrying off a child does not ordinarily get very far in their circle.

The stories and legends coming down through the centuries concerning the kidnapping tendencies of the eagle undoubtedly have their origin, at least in part, in the term "eagle" being applied to other birds, particularly vultures. It is undoubtedly true that the lammergeyer, or bearded vulture, which ranged from the mountains of southern Europe and northern Africa to the Himalayas, and one of the largest birds of prey, was often called a "golden eagle" when his depredations were recited. Specimens have been recorded of this winged giant which measured four feet in length and with a wing spread of from twelve to fifteen feet—the only rival of the Andean condor and some of the albatrosses.

Capable of hurling mammals from high cliffs by beating them with their wings, the lammergeyer has victimized animals as large as the chamois. Thus it is no wonder that this mighty bird figures in song and story. It is equally understandable that these tales embrace even the destruction of man himself, and many anecdotes of children being carried off are current in European literature, few of them, however, of an authentic nature.

But overlooking these legendary accounts there are instances of known authenticity of lammergeyer seizing children. That these are very rare goes far toward proving that such is not a confirmed habit with them. Among the volumes of rhetorical smoke, one sometimes finds a flickering flame, as in Dresser's monumental work, *The Birds of Europe*.

It seems that a little German girl, Anna Zurbuchen, was taken out by her parents on July 12, 1763, when they went to gather herbs in the mountains of Bern Oberland, Mr. Dresser writes. The youngster was nearly three years old at the time, and after playing about for a while she became tired and lying down, fell asleep. Her father came over and placed his straw hat over her face and returned to his work. Some time later, when both parents returned to the spot, the child had disappeared. Frantic search failed to reveal her.

It fell to another resident of the vicinity, Heinrich Michel, to unravel the mystery. Traveling over the mountains from one town to another, he happened to pass near the spot where the child was last seen, and as he plodded by, he heard a scream. Bending his steps toward the sound, he saw in front of him, a lammergeyer take wing from a low mound on the cliff, and soar out over the abyss. Coming to the spot, Michel found the child on the very edge of the cliff, uninjured except for severe bruises on her left arm and hand, where the bird had seized her. Her cap, shoes and stockings were missing. The child was returned to her parents at once, the distance from the spot where she had been asleep being fourteen hundred paces. The youngster's name was changed after this incident to Lammergeier-Anni!

Here is an actual instance, fully corroborated, of a large bird of prey seizing and carrying a small child for some distance. It stands like a lighthouse, as old as it is, among the fabric of falsehood and inaccuracy which has been reared in many countries since. And, as serious as it was, it was not fatal; neither was the bird concerned an eagle.

Bringing authentic cases down to more modern times, there are very few accounts in the annals of American ornithology, that directly condemn eagles. That assiduous naturalist, Alexander Wilson, called the Father of American ornithology, gives one of them—and it concerns an eagle.

"A woman who happened to be weeding in her garden had set her child down near, to amuse itself, while she was at work," he recorded, " when a sudden and extraordinary rushing sound, and a scream from the child, alarmed her, and, starting up, she beheld the infant thrown and dragged some few feet, and a large bald eagle bearing off a fragment of its frock, which being the only part seized, and giving away, providentially saved the life of the infant."

One more account, even more recent and occurring only a few years ago, is set forth in *The Birds of Massachusetts and Other New England States*, by the late Edward H. Forbush. He said:

"The old tales of eagles carrying off children probably have little foundation in fact, but I have investigated one instance of an attack by an eagle on a child which seems to be authentic. I received a report from Mr. M. Semper, of British Columbia, who saw the attack. Mr. Semper writes that he was at a neighbor's house sharpening a 'mower sickle' when the neighbor's little girl, Ellen Gibbs, nine years of age, came running toward the house crying 'Mama, there's a big chicken hawk!' At that moment, said Mr. Semper, the bird sailed directly over his head in pursuit of the child. He dropped his sickle, but before he could reach her the bird had sunk its claws into her arm. He kicked the eagle, partially disabling it, when the child's mother rushed up with an ax and decapitated it. The child's arm was much discolored and cut by the grip of the bird. It was a golden eagle."

It is apparent then, that there have been attacks on children by eagles, but it is equally apparent that in none of these cases were the youngsters carried off. In the sensational stories which periodically appear in newspapers, the transportation item is always stressed and dilated upon. Witness the following which saw the light of day first in a newspaper, and was reprinted in the *Literary Digest* a few years ago.

"The Meece boys and the Phelps boys were startled by a scream. They dropped their play at the summit of Bald Mountain, a peak that towers among the Kentucky Cumberlands, and looked around. Then their hearts nearly stopped beating. Eight year-old Jim Meece had run a short distance away from his brothers . . . . a terrible fate, a fate that menaced shepherds in ancient Galilee and is the subject of legends had befallen him. A great bald eagle had swooped down from the sky and fastened its talons in little Jim's leg. For perhaps two seconds there was a struggle, writes W. O. McIntyre, Mayor of Danville, Kentucky, who tells the story in the *St. Louis Post-Dispatch* . . . . Jim fought wildly and cried out. The bird succeeded in lifting him from the ground, his head hanging down. The struggle continued as the eagle flew to a height, according to the estimate of the other children, of about seventy-five feet.

"Jim kicked out violently. The eagle flew lower. The boys on the ground screamed, too. And at last the bird released its grip and Jim fell. It had flown a distance of two hundred feet . . . . there were bruises on Jim's legs from the grasp of the talons and bruises and cuts on his body from the fall at a height of about twelve feet, but otherwise he was sound and whole . . . . Jim weighs only thirty-five pounds. If he had been a little lighter, the eagle might have succeeded in carrying him away. Meece (Jim's father) who is fifty, says he has never heard of an eagle carrying off a child. He has frequently seen them seize young lambs and carry them off."

To those who are only mildly critical, there are details in this account which appear open to question. An eight-year old boy, able to climb mountains but who only weighs thirty-five pounds is, itself a little out of the ordinary. There are a great many who will not concede that an eagle could fly with a load of thirty-five pounds, but more of this later. The most interesting sidelight on this account is the fact that a friend of mine undertook to find out all about it, after reading the report. After lengthy correspondence and considerable trouble and delay, he discovered that it was all pure fiction! This is the usual result when such stories are traced, but the majority cannot be traced at all.

When definite information is desired by anyone on a specific subject, an expert is consulted. Experts in this line are very naturally ornithologists. They make bird-study a life work and what they say has the backing of personal observation and carefully collected facts. Present day ornithologists are not in accord with the belief that eagles carry off children. In their writings, many of them allude to it but none of them confirm it.

Very well, says the doubter, but what about the case of the discovery in 1931, as stated in the opening paragraph of this article, of a child's skeleton actually in an eagle's nest? Reading the detailed account of this incident, one is impressed by its terseness, and lack of much explained

detail. No eagle was mentioned as having been seen on the day the child disappeared; the nest tree was said to be near the farmer's home, but "near" is a loose term and might be employed in lengths of feet, yards, or miles. It is to be inferred that there was considerable growth about the farm since lumbermen were at work there. It seems then, that it is altogether possible, not to say probable, that the child wandered off into the forest, became lost and met death by starvation. Its remains were discovered by the eagle,—often a carrion feeder—and after becoming light enough to be borne away, were carried to the nest. This would explain the presence of the skeleton in the nest without necessarily involving the eagle in the child's death. At any rate, granting that the incident took place at all, it is a much more probable explanation than that given. Circumstantial evidence is a dangerous thing and more than one innocent has been done to death because of it.

To come directly to the question: is it possible for an eagle to carry off a child at all? Yes, it is perfectly possible for an *infant* to be lifted and carried off. But, how many infants are ever so situated that they are open to attack by eagles? Infants up to two years of age are not usually left unattended for long by parents or nurses. Some infants, before they are two years old, would be too heavy for an eagle to lift, according to the generally accepted idea of their ability in this regard. After all, the matter resolves itself into this question first and last: how much weight is an eagle capable of carrying for any distance?

Some sportsmen and out doors men aver that an eagle is capable of carrying weights which an ornithologist would never grant. These sportsmen are undoubtedly influenced by a vindictive hatred of the eagle because of its depredations on g a m e. Roughly speaking, ornithologists maintain that an eagle can carry a weight equal to its own, or at the most slightly in excess of it. How much then, does an eagle weigh?

Of this there is no doubt. Many eagles have been weighed and the results are known. Professor Francis H. Herrick, of Cleveland, who has studied the bald eagle more intensively in this country than any other person, has found that the male bird "may weigh upwards of eight pounds —the female twelve pounds." Commenting on the child-stealing question, Professor Herrick expressed his views in *The Auk*.

"That an eagle might seize and carry off a small child is perhaps possible though extremely improbable since it is not likely that this bird can lift a body much in excess of its own weight . . . . a bird of twelve or even ten pounds is exceptional, whereas ten pounds is not excessive for the human infant at birth; and by the time such an infant is likely to come within the range of an eagle it is bound to be too heavy for it to master. Though it might conceivably be attacked, it certainly cannot be carried off."

A. C. Bent, of Massachusetts, one of the most prominent of American ornithologists, who at the present time is engaged in the task of preparing the life histories of North American birds, "believes that an eagle is capable of carrying an object of its own weight, or perhaps more under favorable circumstances. It needs the use of, at least, one foot to jump into the air from level ground in a dead calm. In that case I doubt if it could lift more than eight pounds. When launching out from a steep slope, or into a stiff breeze, it would lift more, perhaps fifteen or eighteen pounds."

Dr. H. C. Oberholser, of the United States Biological Survey, maintains that an eagle is not capable of carrying a weight in excess of ten or twelve pounds, except in the rarest instances.

The late Edward Howe Forbush, State Ornithologist of Massachusetts, tells of an observation of A. A. Cross, of Massachusetts, who saw two bald eagles feeding on the carcass of a horse. One of the birds attempted to carry off the detached head of the animal but, though it succeeded in lifting it from the ground, could not fly with it.

Dr. A. K. Fisher, author of *The Hawks and Owls of the United States*, has this to say: "Numerous sensational stories have appeared from time to time relating to the carrying off of children by eagles, the great majority of which have originated in the fertile brains of versatile reporters. There is little doubt that if a hungry eagle found a young baby unprotected it would carry it off. The statements that babies have been carried off by eagles and later recovered from the nest uninjured are as ridiculous as they are untrue. Birds of prey always strike their talons deeply into the quarry before carrying it off . . . . It is possible that some of the stories found in the older books, especially those relating to Europe, may be true, but we know of no authentic instance within the past fifty years of eagles attacking children."

There are some, of course, who do not accept these opinions; there are those who maintain that these weight estimates are too low. But they present no proof; their beliefs are based upon guesswork. They have seen eagles seize and carry off fish, mammals and birds, but none of these have been recaptured and weighed.

The reported taking of lambs by eagles has caused a great deal of comment as to weights. Some maintain that an animal three months old will weigh between twenty-five and thirty-five pounds; others say that a lamb five months old will weigh but twenty pounds. In one instance a very small lamb, two or three weeks old, is said to have taxed its captor to the utmost.

What then can be the result of such wide differences in opinion? Scientific men say that eagles can carry weights equal to their own, or slightly in excess of it. Hunters and many romantic "old-timers" say that the birds can carry weights in excess of thirty-five pounds. An exceptionally large eagle weighs twelve or thirteen pounds. If the scientists' estimate is doubled, and it is granted that eagles can carry twice their weight, the result is that from twenty-four to twenty-six pounds is the limit. And when it is recalled that the majority of eagles weigh from six to eight pounds, their limit, if the scientists' figures are doubled, is sixteen pounds. The conclusion to the whole matter must be that an eagle *could* carry off an infant of such weight. But how many infants of such tender age are ever exposed to attack? It would be a difficult mathematical calculation to figure the chances of attack on such infants by eagles, disregarding the item of their being carried off. One chance in a million would be too conservative.

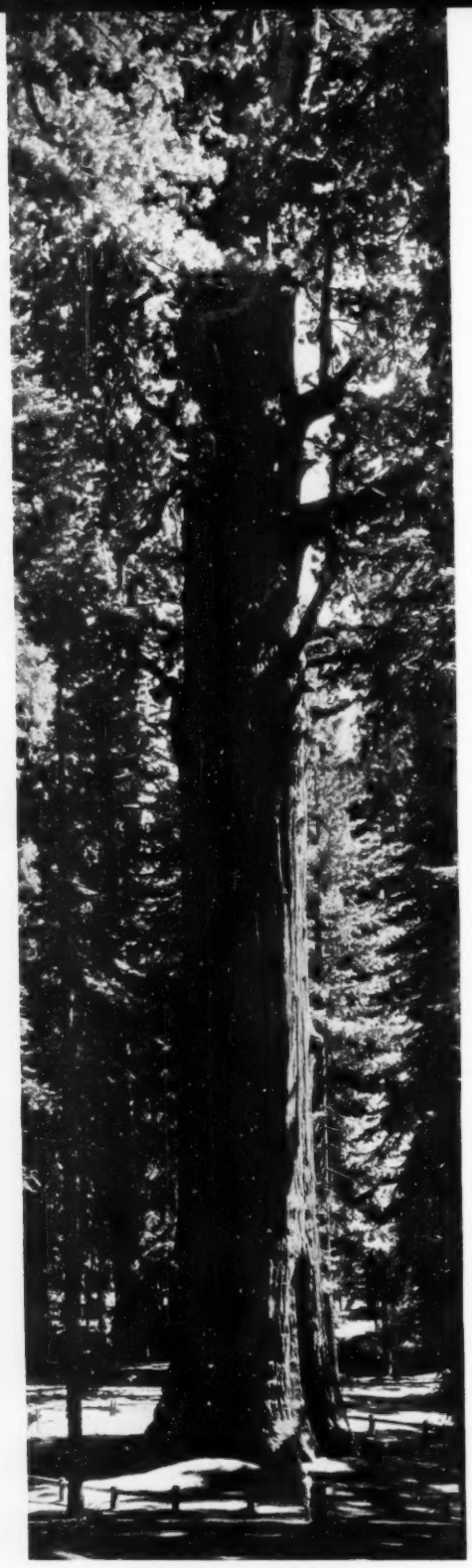
Boy Kills Large Eagle As It Seizes His Brother

By The Associated Press.

LYNCHBURG, Tenn., April 13. —Fifteen-year-old Floyd Tipps was a worthy foe for a massive golden eagle with a wing spread of 35 inches.

The big bird came out a poor second yesterday to Floyd, who beat it to death with a stick as it tried to carry off his 8-year-old brother, Charles.

Attracted by screams and shouts Floyd said he ran to his brother's aid and found the eagle dragging Charles along the ground. Floyd grabbed a stick and flayed the bird across the head until it released its hold on the little boy. Then he killed it.



The Oldest and Largest

The General Sherman Tree, in Sequoia National Park, California, believed to be the oldest and largest tree in the world. Estimated to be 4,000 years old, the giant is thirty-five feet in diameter at its base, reaches a height of 274 feet, and contains 600,000 board feet of timber.

GIANT GROWERS OF THE GLOBE

The World's Oldest, Largest and Tallest Trees

By

T. J. STARKER

EVERY now and then, from the four corners of the globe, come reports of the finding of the world's oldest, or largest, or perhaps tallest tree. Some of these stories are fantastic, while others carry an air of authenticity. But true or false, stories of these giant growers of the globe capture our imagination and we usually accept them in a spirit of wonderment, seldom giving much thought to plausibility.

For many years I have listened to these various claims with incredulity—so much incredulity, in fact, that I have run down every report that gave promise of yielding a tree just a little older, a little bigger and a little taller. Many claims have shrunk under the glare of investigation, some dissolved into the atmosphere. Some fascinating facts have resulted, however, which may or may not settle the question of age, volume and height. For even now some woodsman or forester may be writing a new report which will crown a new champion of the forest.

The four genera that have received the most publicity in this race for size and age are sequoia, eucalyptus, fir and cypress. The sequoia, it appears, with its species, redwood, holds the major records.

If you care to accept it, a sequoia, the General Sherman Tree, in Sequoia National Park, is the oldest tree in the world. It is said to be 4,000 years old. But the same age is claimed for the great old cypress, *Taxodium distichum*, rooted in the ground at Oaxaca, Mexico, where the village of Santa Maria del Tule now stands.

The General Sherman Tree also claims the crown for the largest tree in the world in point of wood volume. More than 1,000 precise measurements and calculations show this sequoia to contain 600,120 board feet.

The tallest tree in the world, the records reveal, is a redwood, standing in North Dyerville Flat, in Humboldt County, California. This giant, dedicated in 1931 to the three founders of the Save-the-Redwoods League—Dr. John C. Merriam, Dr. Henry Fairfield Osborn and Madison Grant—is said to be 364 feet in height. But not far away, in Bull Creek Flat, is another redwood reported to be 345 feet high.

With the champions crowned, at least for the time being, the parade of the giant growers of the globe goes on. In Frothingham's *Forest Service Circular No. 150*, published in 1909, he quotes a record of 380 feet for a Douglas fir. Foresters in the West today have considerable doubt as to the reliability of this measurement. At least this tree cannot be found or even one that closely approaches it, although a fir of that measurement is said to have been felled in 1900.

About 1912 a Douglas fir located near Vancouver, British Columbia, in Canada, was felled with a reported stump diameter of twenty-five feet and a height of 417 feet. The stump diameter has been checked but the felled length is still open to question. Most British Columbia forestry officials are inclined to doubt the reliability of the measurement.

The largest Douglas fir measured by the Pacific Northwest Forest Experiment Station was located near Mineral, Washington. It was slightly over fifteen feet in diameter, breast high, and 225 feet tall,

although the top had been broken out. The first limb of this giant was 100 feet from the ground. Due to a large internal fire scar, it was possible to determine the exact age of this tree. It had been on earth 1,020 years. In 1930 the giant was blown down during a severe wind storm.

Another official count on a Douglas fir gave an age of 1,375 years. This was known as the Finney Creek fir, having been felled or burned down by a homesteader twenty-five years ago. The ring count of the tree was made forty feet above the ground, and T. T. Munger, director of the Pacific Northwest Experiment Station, estimated the total age of the fir to be 1,400 years.

Trees in Australia, the land "down under," have always held a fascination, and many reports of enormous heights among the eucalyptus have come to my attention. These reports claim heights of from 400 to 572 feet.

In 1888 the Melbourne Exposition gave a prize for the tallest tree and the trophy was won by a eucalyptus, 325 feet in height. In Maiden's *Useful Native Plants of Australia,* it is stated: "*Eucalyptus amygdalina, var. regnans,* is probably the tallest tree on the globe, individuals having been measured up to 400 feet, and in one case 420 feet, with the length of the stem up to the first branch 295 feet. The height of a tree at Mt. Baw Baw (Victoria) is quoted at 471 feet."

The United States Forest Products Laboratory, at Madison, Wisconsin, declares that "the tallest eucalyptus of authentic measurement was that of a *regnans* in Victoria, 346 feet high. This tree was felled many years ago."

In the March, 1930, issue of AMERICAN FORESTS, a eucalyptus is referred to near Healsville with a height of 480 feet. Baron Mueller, former botanist for the government, is given as authority.

On April 27, 1932, the *Philadelphia Public Ledger* published as follows: "In a National Park about twenty minutes from Sydney, Australia, there is a eucalyptus tree 572 feet high—seventeen feet higher than the Washington Monument. Trees of this species, native to the antipodes, commonly range from 100 to 400 feet in height, but only the one single specimen is known to have reached the altitude of 'grandfather of them all'." Commenting on the same tree, the *Washington Post* pointed out that "a brass plate attached to the trunk claims for it the honor of being the loftiest living thing in the world."

This reported height seems to be very much open to question. In reply to my inquiry concerning the tree, the Forestry Commission of New South Wales wrote on February 22, 1934: "Relative to a eucalyptus tree near Sydney alleged to be 572 feet high, I am directed to inform you that there is absolutely no foundation whatever for the statement made in the Pennsylvania newspaper of April, 1932. So far as is known, there are no trees anywhere in New South Wales that can be regarded as competitors for the honor of being the tallest tree in the world."

The Australian Commonwealth Forestry Bureau, in a communication to Newton B. Drury of the Save-the-Redwoods League, says: "The tallest tree known in Victoria is in the picnic ground at Cumberland. This has been accurately measured and found to be 301 feet high, with a diameter six feet from the ground of five feet, nine inches. The species is a 'mountain ash,' *E. regnans.* Owing to the difficulty in separating this tree from its fellows it was found well-nigh impossible to photograph it."

But getting back to the sequoias, there are many giant growers other than the record breaking General Sherman and the redwoods at Dyerville and Bull Creek Flats. The General Sherman Tree, the oldest and largest among them, towers to a height of 274 feet, and has a diameter measurement of thirty-seven feet at its base, according to the National Park Service. The same department is also responsible for measurement of other famous giants—the General Grant, Abraham Lincoln and California Trees.

The General Grant is 266 feet tall, with a base diameter of forty feet; the Abraham Lincoln measures 270 feet in height and has a diameter of thirty-one feet at its base. The California Tree, with a thirty-foot base diameter, is 260 feet tall.

A sequoia in Calaveras County, California, is reported as having a circumference of eighty-two feet and a height of 300 feet. It is esti-

The World's Tallest Tree

Existing records give this honor to the "Founders Tree," a redwood in Humboldt State Park, in California. It towers to a height of 364 feet.

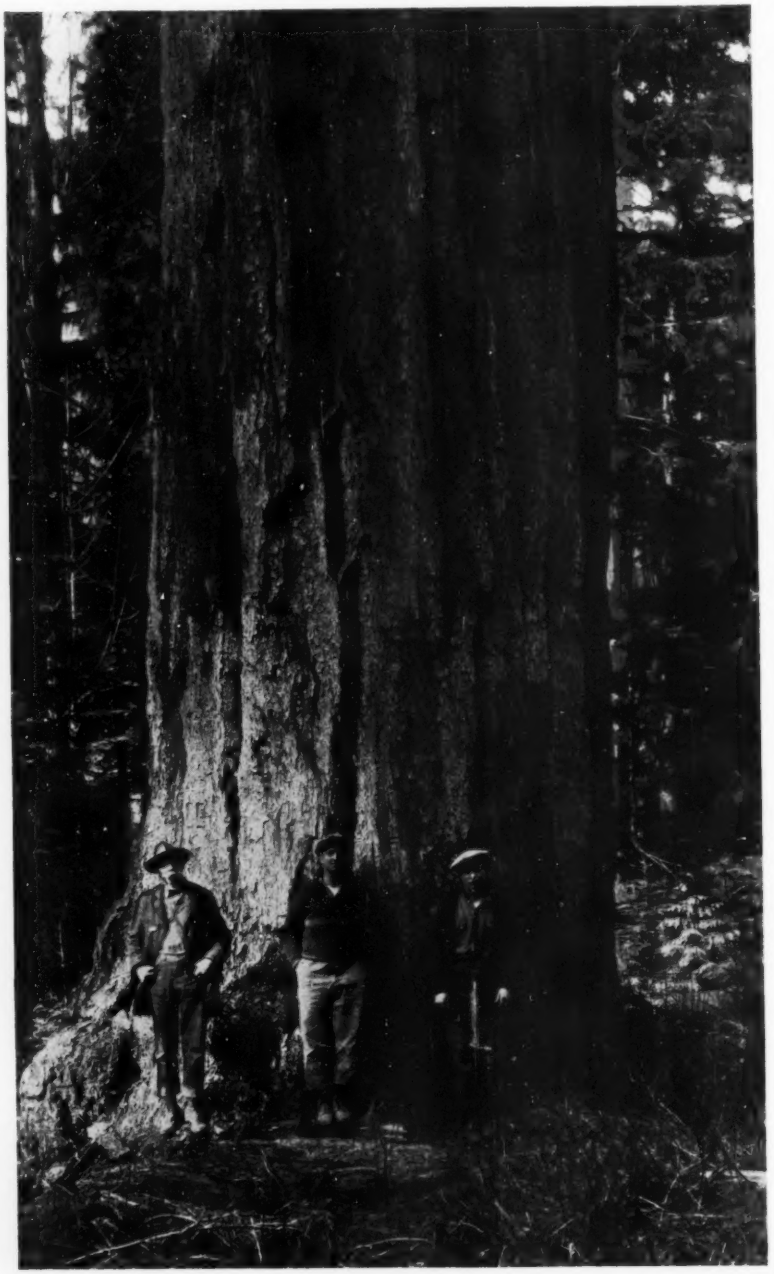
mated to contain 508,000 board feet. In 1853 a sequoia was felled in Calaveras Grove measuring twenty-five feet in diameter, inside the bark, six feet above ground. It was 302 feet tall.

The Save-the-Redwoods League has made an extended search for the tallest redwood and has given the palm to the "Founders Tree" located on North Dyerville Flat, Humboldt County. The authentic height is 364 feet, and it is believed that this is "the tallest tree in the world." Its circumference at the ground is not excessive — forty-seven feet—and it scales 125,999 board feet.

"The greatest diameter for a coast redwood was found in the Santa Clara Tree in the California Redwood Park, in Big Basin. It measured seventeen feet, nine inches in diameter, four and a half feet above the ground," says the Save-the-Redwoods League.

The gigantic trunk of the famous old cypress of Tule, in Mexico, estimated to be 4,000 years old, has often been reported to be 108 feet in circumference at a height five feet above the ground. According to Professor Guillermo Gandara, whose measurements have been accepted by the National Museum of History and Archeology, in Mexico City, the great old tree had a circumference measurement of 175 feet when measured in 1934.

Desert junipers attain extreme old ages. A Rocky Mountain red cedar near Logan, Utah, is reported to be more than 4,000 years of age. It stands on a dry, rocky point and thus has never been attacked by fire. It is protected from vandals by a fence. The Red River Lumber Company, in California, reports the cutting of a very large sugar pine, *Pinus lambertiana*, a few years ago. This tree was ten feet, four inches in diameter on the stump, symmetrical, with no rot and only a small fire scar at the base. In the last forty years it has grown four inches in diameter. A single tree of western white pine, *Pinus monticola*, has yielded 29,800 board feet.



A Giant Among the Firs

Up to 1930 this was the largest standing Douglas fir tree. Located near Mineral, Washington, it had a diameter of fifteen feet, breast high, and was 225 feet tall. It was blown down in a severe wind storm, after having been on earth for 1,020 years.

The largest living kauri tree in New Zealand, according to the United States Forest Products Laboratory, measures twenty-four feet in diameter. Several are twenty-two feet. The great jaquitiba trees of Brazil, it is said, measure up to twenty-three feet in diameter and 150 feet high. A New Zealand newspaper is credited with the statement that a chestnut tree in Sicily measures sixty feet across.

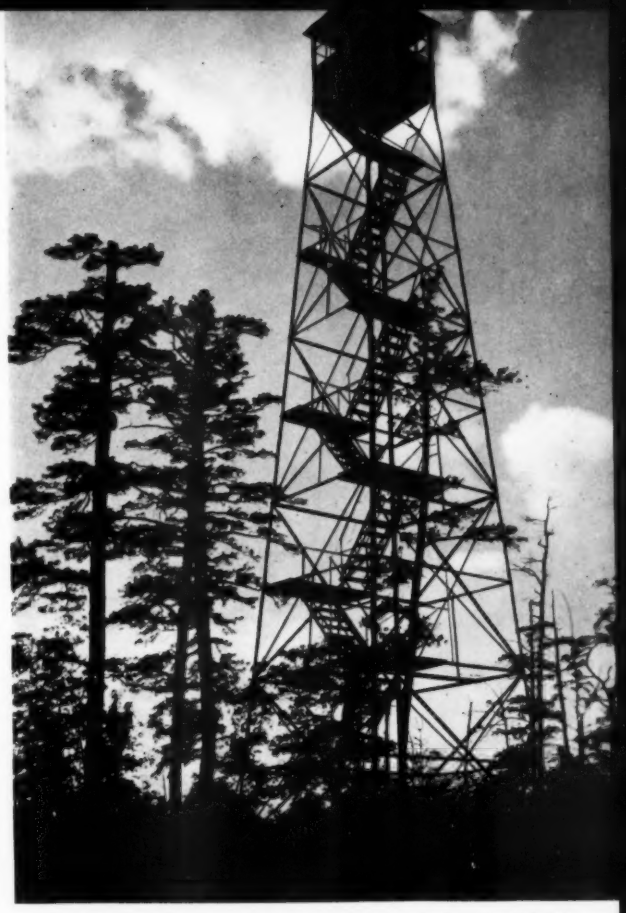
When we consider a tree reaching up into the air more than 364 feet, it is well to ask: "What right has man to cut this tree down to the level of the earth?" And we may also ask: "Is a tree containing 500,000 board feet more valuable when sawed up and made into 100 five-room bungalows, or left as a living monument of God's handiwork to go on for years affording a temple at which to worship?"

IN PENN'S WOODS

WHERE STATE FORESTRY SERVES THE PUBLIC

By

HENRY E. CLEPPER



Vigilant eyes are always watching over Penn's Woods. This is one of the State's 137 steel fire observation towers.

THE other day I opened a newspaper. A headline read "Rains End Danger From Forest Fire." A sub-head further explained "Season's Warfare to Save Forest One of Most Successful in History of Pennsylvania." As I lowered the paper without reading further I seemed to hear the crackling of flames in resinous spruce branches, the roar of heat-laden wind through hardwood thickets, the hoarse voices of fire-fighters bending to torch and rake, the plunk of a double-bit ax into a dead chestnut stub. I seemed to lift my eyes and see dense clouds of blue-brown smoke ascend on high, crimson tongues of flame lick upward on some white pine trunk, and the red rimmed eyes and blackened features of a band of determined men pitting their brawn against the demon unleashed by human carelessness. And suddenly I seemed to understand more clearly something of the romance and the gift of forestry to my State.

For, after all, forestry begins—and unendingly must continue—with protection from fire. Neither wasteful lumbering, nor disease, nor insect depredations will ever wholly prevent trees and forests from growing. Fire alone is the great destroyer. And it is the enemy, fire, against which my State has declared eternal, vigilant warfare.

At one time it was commonly acknowledged that five million acres, known as Pennsylvania's desert, were idle and unproductive because of forest fire. Twenty years ago more than half a million acres of woodland burned over annually in the State. Last year the total area burned was less than 30,000 acres. Twenty years ago the area of the average forest fire in Pennsylvania was more than 400 acres. Last year it was less than fifteen acres. First and most essential outposts of defense are the 137 steel sentinels that stand guard night and day on the highest knobs and ridges of Pennsylvania's mountains. Varying in height from fifty to eighty feet, these skeleton structures of steel with their glass - enclosed lookouts are equipped

There are many well-stocked fishing streams in the Pennsylvania State Forests, and one of the most popular is Loyalsock Creek, shown here, in Sullivan County in the Wyoming State Forest.

A log cabin in the Buchanan State Forest. These may be rented by citizens of Pennsylvania for limited periods at nominal charges from the Department of Forests and Waters, and they are in great demand.

with specially made maps for locating smoke by triangulation. All are connected with the foresters by telephone, some by short wave radio transmitting and receiving sets.

To control the woodland conflagrations 4,000 forest fire wardens have been commissioned by the Commonwealth and equipped with the most modern fire-fighting tools. Together with their organized and trained fire fighting crews, the chief forest fire warden of Pennsylvania now has under his command an army of 50,000 men, ready and willing at all times to go out and give battle to the common foe. A better conception of the magnitude and importance of this ceaseless warfare against the red enemy may be obtained from the value of the Commonwealth's tools and equipment, including the observation stations, acquired for fire detection and control. At the present time they represent an investment of close to $750,000.

Just what are the people of Pennsylvania getting in return for this not inconsiderable sum invested in all kinds of miscellaneous gadgets, varying from cotton torch wicking to radio tubes, from canteens to cross-cut saws. First and foremost, they get protection for the State's woodlands—and that means all woodlands regardless of whether they are publically or privately owned.

Of a total land area of some 28,690,000 acres, Pennsylvania contains 13,050,000 acres in forest or potential forest, representing roughly forty-five per cent of the entire surface acreage. Now, the Department of Forests and Waters is charged by law with protecting from fire all forests in the State. Even if three and one-half million acres of farm woodlots are deducted from the total forest acreage, because fires rarely occur in these small tracts, there still remain some nine and one-half million acres to be protected. It is readily apparent that the Commonwealth's investment in fire tools and equipment, when spread over such an enormous acreage, really amounts to very little—less than eight cents an acre.

As proud as Pennsylvanians may justifiably feel about their forest fire army, so may they take equal pride, though perhaps for a different reason, in their State Forests. Comprising 1,648,000 acres and located in thirty-six of the Commonwealth's sixty-seven counties, principally at the headwaters of the most important streams, they now amount to twelve and one-half per cent of the Commonwealth's entire wooded area.

The story of how the State Forests came into existence makes an interesting chapter. Pennsylvania's fertile farmlands are the result of the accumulated richness of our primeval forest. Her mining industry was made possible because of bountiful wood supplies available almost at the mine openings. Her ship building and shipping industry developed largely because of our magnificent stands of conifers and hardwoods. Construction of thousands of miles of railway lines was stimulated because wood was available along every right of way for

In the small State Forest public camps, an outing of a day or two in the woods may be enjoyed away from the crowds that ordinarily are to be found in the larger parks.

poles, ties, and fuel. And last, but not least, her great lumber industry, which has contributed so greatly to the wealth and growth of the Commonwealth, was derived from the very life of the forest itself.

Although wood had played an important part in the development of Pennsylvania for 200 years, strangely enough it was only a little more than fifty years ago that public consideration was given to the idea that it was time someone began caring for our forests. And at the turn of the present century forest devastation at first as a result of lumbering, later by forest fire, had made serious inroads into our remaining stands of native timber.

Many families now take annual motor-camping trips to the State Forests. The Caledonia State Forest park, on the Lincoln Highway near Gettysburg, has one of the largest of these colonies of campers.

Fortunate, indeed, is the state or nation having men with the vision to conceive and the ability to do, and doubly fortunate has Pennsylvania been in her conservation leaders. As early as 1897, a small but enterprising group of public spirited citizens, led by the late Dr. Joseph T. Rothrock, now known as the Father of Forestry in Pennsylvania, urged that laws be enacted to restrain further forest destruction and to create State Forests.

Largely through their efforts, an act was passed by the legislature that year making an appropriation for the purchase of land by the Commonwealth for forestry purposes. The following year some 17,000 acres were acquired and this acquisition program so modestly begun, though occasionally temporarily interrupted, has never ceased.

Of all the multitudinous services rendered to its citizens by the State government, there is none, it is hardly an exaggeration to assert, that is more widely used than the State Forests. Why this is so may be better understood when it is explained that, according to law their purpose is:

To provide a continuous supply of timber, lumber, wood and other forest products, to protect the watersheds, conserve the waters, and regulate the flow of rivers and streams of the State, and to furnish opportunities for healthful recreation to the public.

And there, in that last phrase, is the reason why the forestry movement in Pennsylvania has been so popular and so consistently supported. The State Forests belong, not to the State, but to the people of the State, for whose enjoyment they are open at all times. Although a law limits the price that may be paid for land for forest purposes to $10 an acre, so carefully and so honestly have Pennsylvania's State Forests been purchased that the average cost to date is only $2.43 an acre.

The entrance to the picnic grounds and nature trails in the Cook Forest Park, Jefferson County, where one of the largest remaining stands of virgin timber in Pennsylvania may be seen.

An especially interesting policy with respect to public use of the State Forests, and one that is enormously increasing in popularity, is the permanent camp site program, under which the Department of Forests and Waters leases to citizens, clubs, and other organizations of Pennsylvania small pieces of land from one-tenth to one-quarter acre in size at nominal annual rentals for ten-year periods with the option of renewal. Summer homes, hunting cabins, and other buildings are erected on these sites by (*Continuing on page* 301)

This photograph shows the ancient landmark clearly, and the erosion scar which necessitated a "face-lifting operation" on the famous Arrowhead.

SAVING A FAMOUS LANDMARK

Foresters Preserve Great Arrowhead of the San Bernardino Mountains After Erosion Threatens Disfigurement

By H. V. BEEKS

A STRANGE surgical operation has been performed on the famous arrowhead landmark on the steep south slope of the San Bernardino Mountains in Southern California. Not an ordinary operation this, but one up to the minute. The face of the arrowhead has literally been lifted. Instead of scalpel and tweezers, sledge hammers and crowbars were employed by the surgeon and nurses—a crew from the "improvement" and "fire fighting" forces of the San Bernardino National Forest, including Tom and Jerry, two Government mules. Instead of sterilized gauze and aseptic silk stitches, iron rails and coarse chicken wire were used in tidying up the face of the arrowhead; cement, rocks and gravel in place of iodoform and unguent.

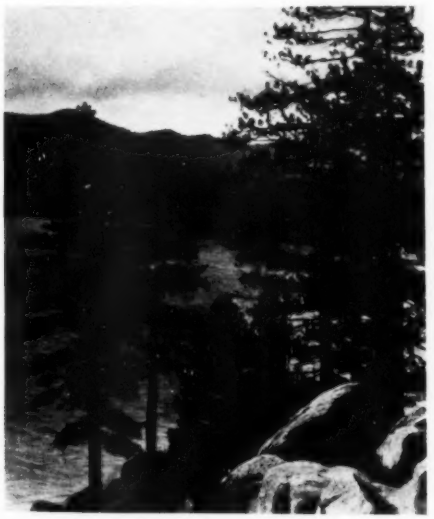
A close-up taken in the Arrowhead, showing the sharp and definite edge of the erosion gully.

World-travelers, movie stars, airmen, tourists and all Southern California natives have seen and remember the huge arrowhead landmark embedded on the mountain slope north of the City of San Bernardino. The sight of the steep chaparral-covered mountainside, the color of fawn corduroy, with the arrowhead standing sharply out in a lighter color, is not easily forgotten. A light or pur-

(*Continuing on page* 303)

SEEN ON THE ARROWHEAD

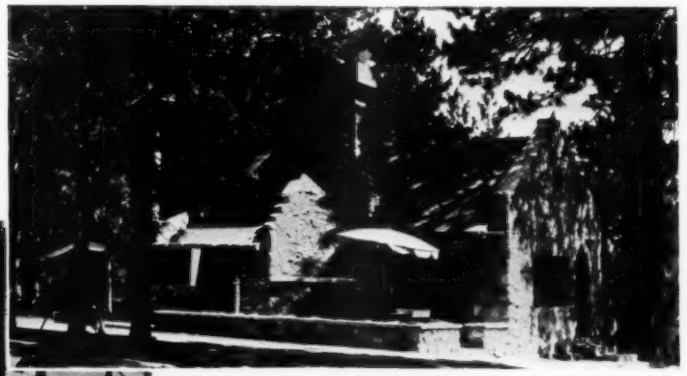
One of the fire-towers overlooking the Arrowhead region.



Typical scenery along Bear Lake, which is nearby and usually visited by those who see the Arrowhead.

Palm Canyon, near the San Bernardino National Forest, and through which the Indians traveled to reach the Arrowhead.

On the Scenic "high-gear" road above the Arrowhead.



A summer home on the San Bernardino, just above the Arrowhead region.

Good fishing grounds abound and this scene is at the lake-side—a fisherman's cabin.

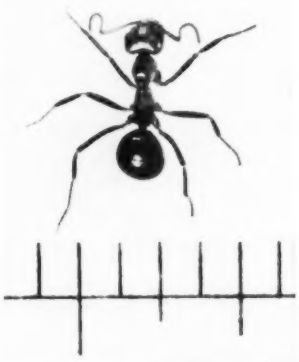
ANTS IN THE FOREST

Are They Guardians or Vandals?

By GEORGE S. PERRY

ANTS are among the most numerous year-round residents of the forest. Many insects winter as eggs or in other dormant states; others show great fluctuations in numbers as between summer and winter. But ants persist in fairly uniform numbers at all times. Most of them retire into specially constructed subterranean quarters that are impregnable to the "sullen hosts of winter" and other enemies that prey upon them. Of course, they are in a state of more or less suspended animation during this season. Yet, if one digs down and breaks into their republic in cold weather, its hosts of citizens are found somewhat sluggish, but apparently undiminished in numbers or devotion to their commonwealth.

Scientists state that the notable increase in the activity of ants in spring and summer is in response to the stimulus of temperature. Humorists say it is due to their anxiety to be present at all the picnics and other social events that transpire outdoors in mild weather. In any event, ants in the forest are a fact and not a theory. It is a matter of more than passing interest and possibly of very great importance to know more of the roles they play. Are they the despised villains most people rate them or do they render a guardian service in the complex community of the forest?



An adult worker of the red mound building ant (*Formica exsectoides*). The small divisions on the scale represent one thirty-second of an inch.

American entomology is still in its infancy in many respects. The systematist finds a vast and alluring field to occupy him. There are so many unquestionable and unmitigated pests demanding attention that few men trained in this line have found time to devote to insects whose detrimental effects on crops or other human interests is dubious. These facts have led many authorities on insects to dismiss ants as neutrals in the human struggle for existence or possibly to account their work balanced, with debit and credit activities nearly equal. It is untenable to defend such a summary and smug dismissal of these constantly teeming millions of insects. No other form of life, with individuals of equal size, could occur in forest or field in such numbers without doing some obvious damage and arousing widespread interest and painstaking study.

The wise king Solomon exhorted the sluggard to "go to the ant, consider her ways and be wise." There is undoubted rebuke for the lazy in the ways of the ant, but the casual observer watching these little creatures in their wanderings generally acquires an abiding disrespect for their intelligence and efficiency. Their haphazard course, up and down, over and under, is utterly aimless, in an age when an objective is sought by the most direct route. The ant is admittedly busy, but he has only two speeds, slow and stop, unless spurred by the stimulus of fear. Most ridiculous of all is the lack of teamwork and ability to cooperate which two or more ants display when they unite their efforts to handle a burden too large for one. Only by the purest accident do they make any progress, and this is in a most devious direction and despite the impeding efforts of the minority assisting in the task. But if ants as individuals can hardly qualify as efficient workers, Solomon was nevertheless right when he viewed their social system and their engineering projects for the propagation and nourishment of their kind. Their successful and admirable struggle for existence against countless natural dangers, enemies, and obstacles, testifies to a divinely implanted wisdom.

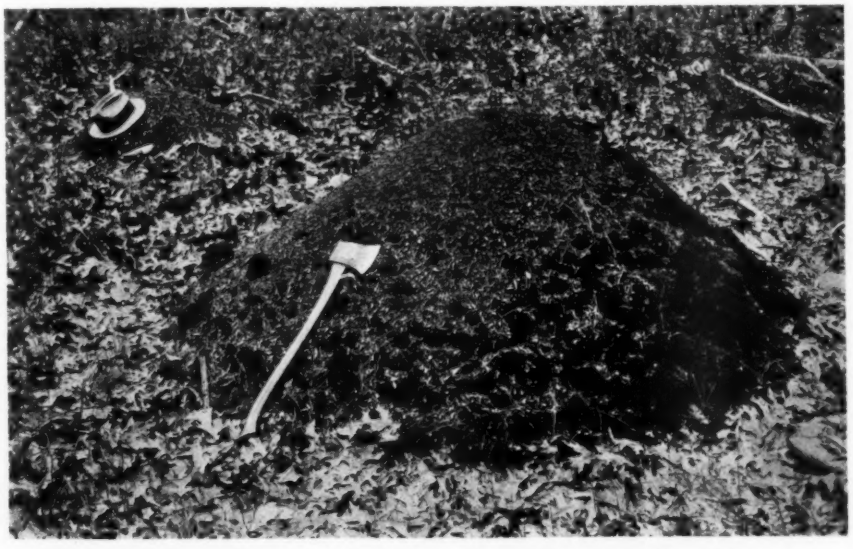
"Look to the ant"—these busy little workers find their most favorable field of activity in warm and sunny openings in the forest. This red mound builder is the characteristic ant of the forests of eastern United States.

Ants vary in abundance in the forests of a given region just about in direct proportion to the amount of sunlight which reaches the

soil. In open stands of pine and oak they are commonly present in great numbers. In darker forests of hemlock, spruce, or beech, they are relatively rare. Warmth is undoubtedly necessary to the development of the eggs and young. Cool and moist coves are relatively free of ants, while they often abound on nearby ridges and south slopes. Foresters noted years ago that the mound building red ants of the eastern United States often killed the pines or other trees planted near their mounds. The method of inducing death in the trees is quite peculiar. Special studies revealed that trees dying around ant mounds, especially white pine trees, always showed typical cankers or lesions near the ground. The activities of the ants on this portion of the tree raised a suspicion that they were killing the trees by injecting some poisonous substance into the bark. Scientists surmised it might be formic acid, imitated the ants by injecting formic acid from the laboratory into the bark of trees with a hypodermic needle and killed trees in the same way, with all the characteristic symptoms.

A black locust sprout recently killed by attacks of the mound building ant. The white blotches show where these insects have gnawed off bark during the current season. The arrow points to a lesion near the ground surface where typical incomplete healing occurred following an earlier attack.

To demonstrate how necessary it is that ants have the full intensity of the sun, experiments were made in covering their mounds with brush and litter, in the hope that they could be eliminated from forest plantations where their damage was considerable. Some colonies heavily covered in midsummer succumbed to the treatment. But where mounds were covered thinly or in spring, the ants had sufficient intelligence to move their quarters and construct a new mound where sunlight was available at the edge of the brush pile.



A two-mound colony of ants in a forest glade. The older and larger mound, as shown by the growth of moss and lichens, is now shaded too much for the best interests of the larvae, hence a new mound is being built nearby where more sunlight is to be had.

About ten distinct kinds of ants occur rather frequently in forests of eastern North America. Two of these, however, are sufficiently large and widely distributed to merit special mention. The black carpenter ant (*Campanotus pennsylvanicus*) more often dwells in a home of wood, instead of earth or stone. Large trees with relatively soft wood having wide growth rings with large pores are favorite homes for these ants, which often excavate elaborate labyrinths up the bole and through the heartwood. This ant is quite adaptable, however, and may make its home in a great variety of situations. Sometimes it is a nuisance in dwelling houses, and where this is the case, there is danger that it may mine out and weaken timbers used in construction.

The most aggressive and typical ant of eastern forest regions is the red mound building ant of the Alleghenies (*Formica exsectoides*). It prefers mountain or hilly woodlands where the soil is sandy, but other locations are often accepted. It is this ant to which reference has been made as detrimental in forest plantations. It sometimes steals the larvae and pupae of black ant colonies and rears them as slaves. It is tireless and rapid in its movements. In warfare it probably uses formic acid secretions in chemical and gas attacks upon its enemy. It is a herder and breeder of aphids, or in common parlance plant lice. It is primarily the relations of ants and aphids that are important in the plant world. In some cases these creatures are apparently absolutely interdependent. Certain forms cannot exist without their symbiotic associate. However, this is not the case with the large red ant. It hunts and feeds quite indiscriminately on many sorts of food both animal and vegetable. When these ants are observed on their return to the mounds, they are frequently found to carry insect larvae and small seeds.

One observer concludes that the food of most ants is very largely derived from plant lice. The sugary excretions of these tiny creatures are the lure which attracts ants to the topmost leaf or bud of the tallest tree. Plant lice are frequently a heavy drain on the vitality of trees and other vegetation. Honey dew is an instance where their excretions are so abundant as to attract human attention and feed swarms of bees, wasps, hornets, flies, and the like, as well as ants. The small and delicate plant lice fluctuate greatly in numbers in keeping with weather conditions and other favorable or unfavorable circumstances. (*Continuing on page* 304)

Good Composition—It Pays!

By RAYMOND A. WOHLRABE

TWO photographers might select the same place in a forest or wooded region to make a photograph and the work of one turn out to be the type that wins admiration while that of the other is just the usual run of photograph, lacking entirely any pictorial charm. Both might have used their cameras as cameras should be used. The exposure time was right. Focusing was correctly done. But one produced an artistic piece of work, the other a simple photographic record.

It is logical that the first step along the road that leads to good pictures is to master the use of the camera iself. The second step, equally important but often a step that is never taken, is developing "an eye for good composition." One need not be an artist to know when the composition of a picture is good. Pictures possessing this characteristic can easily be distinguished from those in which little or no thought was given to composition when the picture was taken. Perhaps it is difficult to point out just what it is that contributes to a picture's perfection in this respect. But there are a few rules photographers can follow that will take them along the right path. Then, as one develops the habit of checking up on these points before making an exposure, his "eye for good composition" improves and the improvement is decidedly rapid.

AND ONLY FIR TREES KNOW

Fir trees keep a secret
Only fir trees know . . .
It has to do with water;
It has to do with snow.

It has to do with mountain peaks,
With the wind that wars
Forever in fir branches;
With the clouds and stars.

A secret, an enigma,
A little, lighted spark . . .
Ask the fir cones if they know;
Ask the bark.

—Ethel Romig Fuller.

It is always well to decide first what is the principal object in the scene being photographed. It might be a snow-capped mountain with forested foothills about it. A very conspicuous tree might hold the center of attraction. Or perhaps it is a lake. Place your camera so that the position of this principal object in the finder or on the ground glass is well off center. If it takes the central position the symmetrical appearance of the finished print will spoil much of the attractiveness of the scene.

There will always be a number of conspicuous objects in addition to the principal one—a more distant tree or group of trees, a smaller mountain peak, or perhaps a very prominent cumulus cloud in the sky. A good plan is to let such objects take positions at the angles of triangles each of which has the principal object at its apex. Never allow too many objects to find their way into the scene. They will lead to a serious muddling just as too many shrubs will ruin a piece of landscape gardening which might otherwise have been beautiful.

Selecting the proper point of view is worth much consideration. Doubtless you have experienced the marked change your shifting from one position to another, from low ground to a wooded knoll, creates in the general appearance of the scene. One position will accentuate certain characteristics while another position will accentuate others. Possibly it will mean considerable moving about to find the location yielding the ideal point of view, but there is always ample reward in the end for the time that is spent.

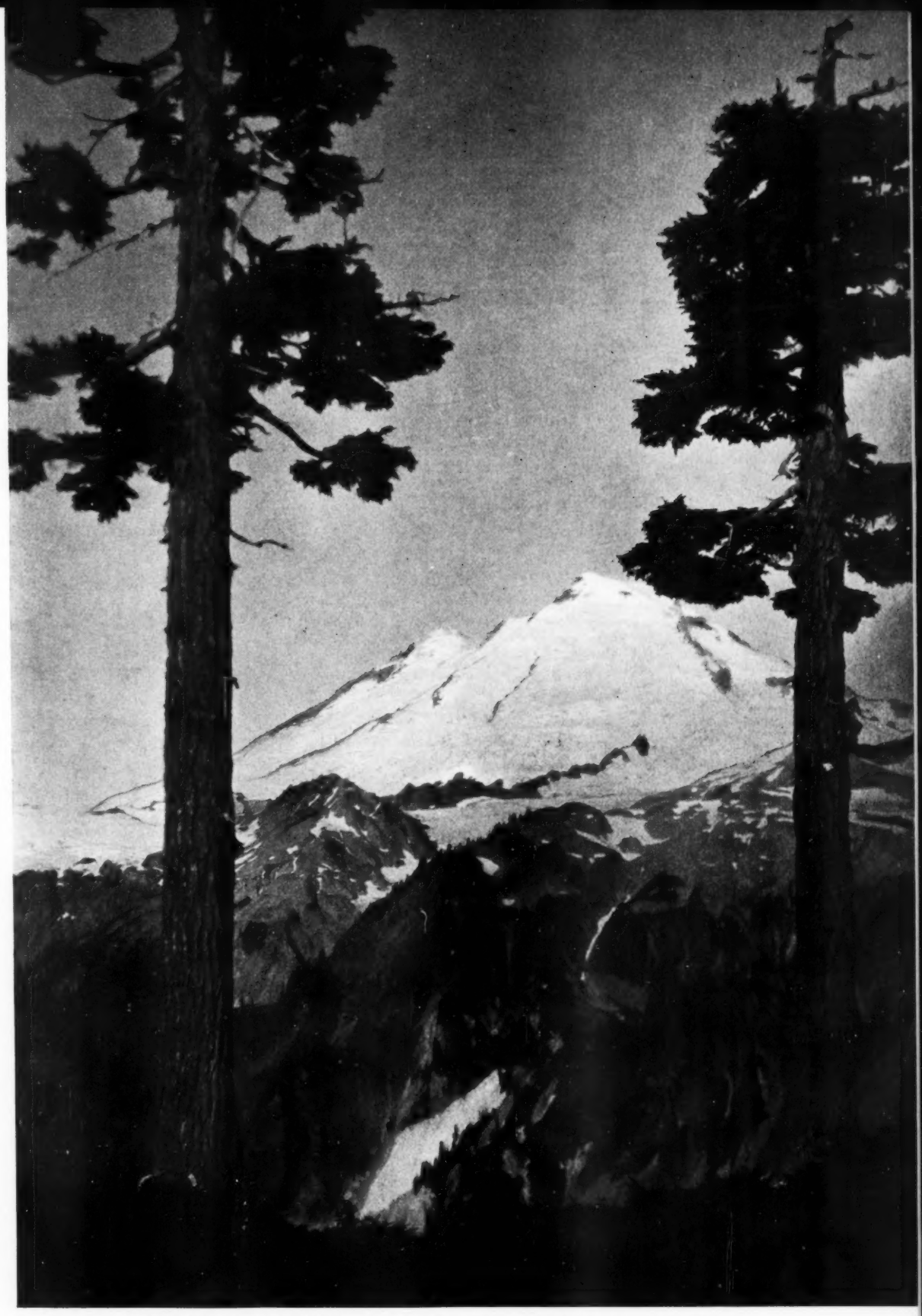
Highlights and shadows should never be equally distributed throughout a picture. The dark areas should be massed in one corner or at one side and the bright areas or highlights should lie opposite these. Too uniform a distribution results in a splotchy, patchy effect—leads to confusion and great harm to the pictorial value of the finished print.

There must be harmony in any picture. To give an exaggerated example of a lack of harmony and its effect, just imagine how out of place a man attired in a tuxedo would appear in the foreground of a picture taken in the Rainier National Forest. His presence alone is enough to ruin the desired effect. For really beautiful forest pictures that carry with them the suggestion of the aroma of conifers and the scent of forest flowers, the cool of shady nooks—one must include nothing that is not in harmony. The presence of an automobile on a road in the foreground might be given as another example of the lack of this quality. Of course there are times, such as when a picture's purpose is to advertise a make of motor car, that such an inclusion is proper.

To give an idea of the proportions of a tree, the great girth and height, an individual is often included as a measuring stick by which the comparison can be made. It is sometimes desirable that this be done. But the appearance, and the harmony, of the photograph will be greatly improved if the individual is attired in the clothes of a camper, lumberjack, or forester.

Composition plays so important a role in determining whether our photographic work falls on the right or the wrong side of the vague boundary line that separates artistic pictures from mere photographic records, that what consideration is given it in preparation for the actual taking of the picture always yields big dividends in return.

The proper procedure, then, for the photographer who earnestly desires pictures that show the observer something of the real beauty of a forest might be summed up in the following suggestions. First determine the size of stop and the shutter speed you will use under the conditions prevailing. Experience or a good exposure meter will have to be relied upon for this. Then tramp from one position to another, noticing the effect the change has upon the general appearance of the various objects you wish to include in the photograph and keeping in mind the characteristics you wish emphasized. When you have finally chosen a position which yields the desired effect shift a little from right to left, back and forth, until the major objects are well placed with respect to one another. Check over your diaphragm aperture and speed; and when the clouds in the sky are right—then shoot. It will have taken time to do all this—but the cost in hours or minutes will be well paid for by your satisfaction in your picture harvest.



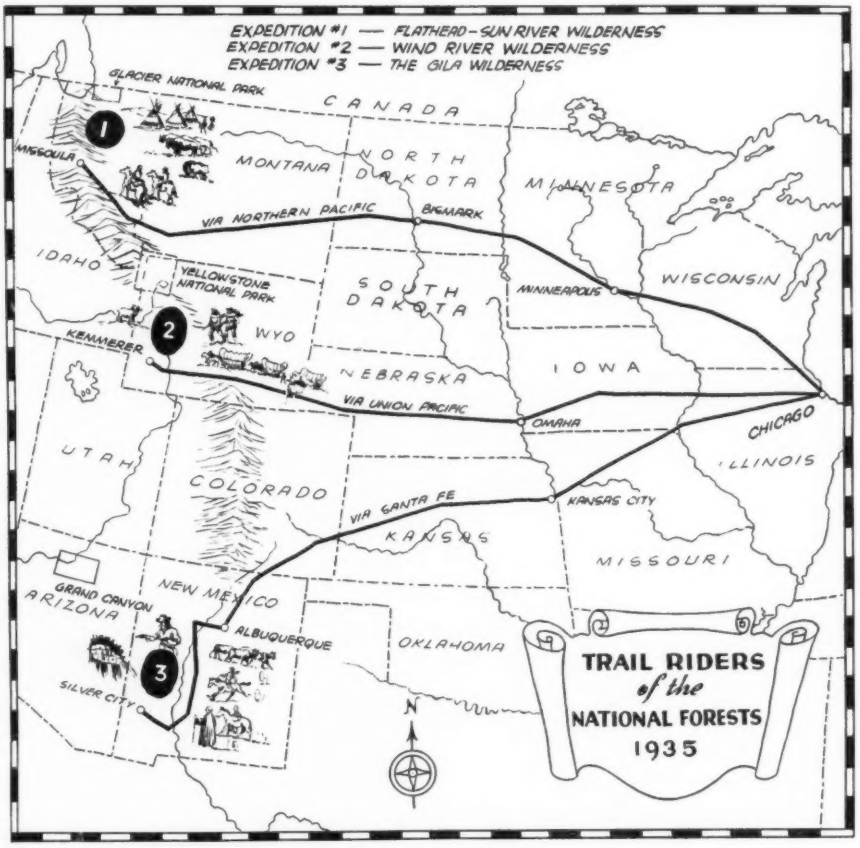
"BETWEEN THE TREES"—Perfection in composition is attained by Dr. K. Koike in this photograph taken at Austin Pass, in the Mount Baker National Forest in Washington.

First Wilderness Expedition in July

Montana's Million Acres of Untamed Wilderness, the Country "At the Back of Beyond," Lures Trail Riders of the National Forests in July. Still Time to Join This and Other Expeditions for Unique Summer Vacation

ON THE morning of July 8, an excited group of men and women will gather at the little town of Missoula, Montana, on the edge of America's greatest remaining wilderness. They will have come from every section of the country, by train and by motor, for the thrilling purpose of exploring the vast and rugged virgin country "at the back of beyond," as the wilderness of the Flathead and Sun River, in the Flathead and Lewis and Clark National Forests, is known. On the morning of July 9 they will respond to the call of "boots and saddle" and become the first group of Trail Riders of the National Forests to enter the wilderness in 1935.

Two other parties will follow these pioneer riders into the wilds, one into the Wind River Wilderness, in Wyoming, the top of the continent where glaciers vie with purple daisies, and where famous old Jim Bridger sought and found solitude; and one into the Gila Wilderness, in New Mexico, the land of the American aborigines, which has held its mystery through four centuries. The Wind River riders will get under way from Kemmerer, Wyoming, on the morning of July 30, while the Gila riders will take the trail on August 21, from Silver City, New Mexico.



THREE WILDERNESS TRAILS--WHICH WILL YOU TAKE?

But it is the first group, the Flathead-Sun River Wilderness riders, who will do the pioneering for 1935, who will be the first to view lofty mountains, many unnamed and unknown, and who will sleep beneath the early summer stars. Former Trail Riders know the great experience that is in store for them, for this region, which lies just south of Glacier National Park, and north of the Yellowstone, was the scene of the 1933 and 1934 expeditions.

No roads lead into this great primitive land. Reached only on foot or with pack and saddle horses, it remains as it always has been—an untamed land of romance and adventure. It is a country of lofty mountains, dramatic in their boldness, the summits of which rise above green-mantled slopes, where never failing streams run vigorous and cold, now leaving the virgin forest, now meandering through flowered meadows. It is a land where bears, deer, elk and mountain goats live practically undisturbed by man, a country two days' journey by trail from the noise of an automobile horn.

Its scenic value is without parallel. The peaks and ridges of the Continental Divide rise in huge escarpment. To the west rise the bulky summits of the Swan Range which look down on beautiful lakes in rocky basins formed by ancient glaciers. To the east is the Sun River country where the Piegan tribe of the Blackfeet Indians held its ceremonial sun dances of worship. Backed up by the great Shining Mountains, so named in 1743 by the poetic French explorers, Pierre and Chevalier de La Verendrye, the Sun River region is rich in history, romance and tradition. There the intrepid Lewis and Clark counted more than 10,000 bison in one herd in 1806, homeward bound from the Pacific. And somewhere in that broad land is treasure—ancient treasure, buried, so the story goes, by Henry Plummer, road agent, desperado and robber, in the days before the Vigilantes rode for such as he.

Within this untamed area lies the mysterious and picturesque "Chinese Wall"; and the Sun River herd of elk, 9,500 strong, roams the range once grazed by countless thousands of bison.

(*Continuing on page* 303)

EDITORIAL

What is Conservation?

ONCE again there is talk in Washington of removing the Forest Service from the Department of Agriculture. This time it is generated by a bill recently introduced in Congress by Senator James Hamilton Lewis, of Illinois, proposing to change the name of the Department of the Interior to the Department of Conservation and Works. Despite the public statement of last January, when Secretary Wallace said "I am authorized to say that the Administration has not contemplated and does not now contemplate transferring the Forest Service and the Biological Survey from the Department of Agriculture," the threat raises its head.

Under the broad meaning of "conservation" Senator Lewis' bill could be interpreted as a means to assemble within a single department such Government activities as the conservation of minerals, water, forests, wildlife, fisheries and humanity itself. If the purpose of conservation is to keep the natural resources so abundant that man may live happily, fruitfully and relatively free from suffering, it follows that the elements of conservation must enter into every department of Government. Conservation, then, is not a function nor even a method, but a basic principle of social action applicable to diversified natural resources.

Conservation of oil, coal, or other minerals must be achieved by means other than the conservation of water, of forests, wildlife, fisheries, or the fertility of the soil. Oil, coal and minerals are inert materials—without life. The processes whereby existing supplies may be partially replenished are so slow as to be negligible. To conserve them is to use them with as little waste as possible. In water we have an element whose conservation is essential to that of all natural resources. Ever in circulation, passing from the land to the sea, and back again to the land, it must be controlled, maintained, and kept free from pollution. Its conservation is its complete utilization. The forests, wildlife and fisheries, however, are alive. They or their products may be renewed. In their conservation the vital forces of reproduction and growth must be dealt with.

Theodore Roosevelt had in mind the perpetuation of our forests when he defined conservation as "preservation through wise use." The same principles may be applied to field crops, domestic animals, wildlife, or fisheries, for both forestry and agriculture are concerned with the successful use of land. They constitute inseparable parts of conservation as included within the Department of Agriculture. To attempt to sever them in order to build up a Department of Conservation and Works would make wounds difficult to heal because of the accompanying unwarranted duplication of effort.

It has been suggested that administration of the unappropriated Public Domain by the Department of the Interior justifies that Department in seeking to include all lands in public ownership. But the traditional job of the Land Office has been the disposal of the Public Domain—not the management of the land. Only since the passage of the Taylor Grazing Law, in 1934, has the Department had authority to apply the principles of conservation in the management of those lands.

Administration of the National Park Service reflects credit to the Department of the Interior. The primary objectives of that bureau are to preserve natural features as they were originally found, to offer education and to provide recreation. Neither the waters that flow through the parks, nor the forests, nor the wildlife are considered as naturally replenishable resources. Taken in their entirety the National Parks represent something that has achieved a degree of perfection and must be preserved, while conservation as applied to National Forests implies a sustained economic use of the forest and its products.

Rather than transfer the Forest Service, the Biological Survey, the Soil Conservation Service, from the Department of Agriculture for the upbuilding of another department, why not complete responsibility for land administration in the Department of Agriculture by including range management on the Public Domain as authorized under the Taylor Act? After all, range management is primarily soil conservation, production of forage crops and animal husbandry. It would not necessitate building up duplicating functions to continue in the department where it now resides.

With the Congressional Calendar cluttered with thousands of bills whose proponents are clamoring for consideration there is little justification for bringing this problem into the forum. If the question must be discussed again, however, let it be so thoughtfully and completely considered that the reorganization which may follow will be permanent and practical. This can only be done by remembering that the application of conservation to our non-renewable inorganic resources differs from conservation as applied to the living organic resources. The bulk of the organic conservation program is now properly placed in the Department of Agriculture. By including other similar agencies such as the Division of Grazing Control and the Bureau of Fisheries, the purposes of conservation would be better served than by shifting those which are now in their natural element.

FIELD AND FOREST FOR BOYS AND GIRLS

THE ENGLISH SPARROW and TRAVELING HOUSES

By JOHN HARVEY FURBAY

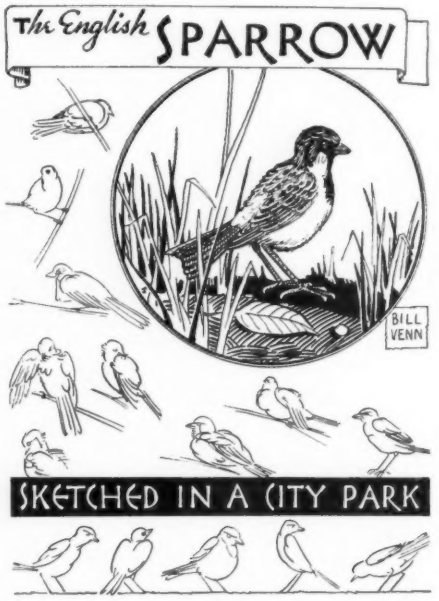
Illustrated by William D. Vennard

ENGLISH sparrows are looked upon today as degraded, troublesome pests, like mice, or roaches, or flies. Yet it is only a little over eighty years since they were imported in cages from England, and were given places of honor in the public parks of New York and Boston. The first English sparrows to enter America were brought in about 1850 and liberated in Central Park in New York City, where special bird-houses had been prepared for them.

At first, these birds were welcomed as the "pets" of the city. Other cities followed the example. It was erroneously believed that they would destroy the great armies of canker worms which were devouring the leaves of the trees at that time. But the wayward little sparrows did not live up to expectations, and took to eating seeds, fruits, and grain—leaving the canker worms to continue their destruction.

When the truth was learned, it was too late to deport them. They had multiplied rapidly and had spread throughout the whole countryside of the Atlantic region. Every house and barn soon became a nesting place for them. In a short time, they had overspread the entire North American continent.

No longer were they called "darlings" or "pets." They were cursed. They had aroused the wrath of both the city and the country. They were devouring grain crops, defiling buildings, fighting smaller birds with great pugnacity, and driving away many of the most beautiful birds.



Found breaking the eggs of other birds, tearing up the nests, and throwing out young birds, they were like a plague to the warblers and finches. By their fighting natures, and by their great numbers, they soon drove away the gentler and more colorful birds of the parks and gardens. In some towns they were soon the only birds to be seen, according to reports of those days.

The English sparrow is still here. His habits have not improved. He is the "black sheep" of the whole sparrow family, of which there are over 500 species. Campaigns to poison him have been laid throughout the country. In the Lake Tulare district of California an airplane was used to scatter poisoned seeds over thousands of acres, but his numbers do not seem to grow much smaller.

His habits are familiar to most of us. He does not migrate with the other birds when fall comes; he is a permanent resident. He is polygamous, and mates successively with several females each year. Mating and rearing young often take place from February through to November. A government report, estimated the possible increase of one pair to be 275,716,983,689 in ten years.

Their nests are often stolen from other birds, then enlarged. Four or five females sometimes build a communal nest ranging in size from a peck measure to a bushel. Great heaps of grass and feathers compose the nest.

Gene Stratton Porter used to relate the story of a pair of cardinals which had selected a nesting site near her home. She said that as fast as the cardinals carried nesting materials to their selected spot, and left to gather more, the English sparrows flew in, took the material, and carried it high in an elm tree where they were also building a nest. This strange drama lasted for two days, after which the cardinals gave up and left the place, and the sparrows gleefully claimed the spoils.

Besides their destruction to other small birds, English sparrows are birds of disgusting habits. They are too lazy to secure their own food in a legitimate manner, preferring to feed from garbage cans, to steal from the chickens' feed, and to rob seed bins and granaries. They have no song. They are not pretty. And they are always lousy.

It would be unfair, however, not to mention some of the good traits of this much-despised bird. He is not entirely bad. He helps destroy weeds by eating great amounts of weed seed. It is reliably estimated that the English sparrows destroy at least 875 tons of weed seed in the farming sections of the State of Iowa alone in one single winter. A biological survey of birds along the Pacific Coast showed that the food of Mr. English Sparrow averaged 86.2 per cent weed seeds. This figure was determined by examining the crops of hundreds of sparrows killed for this purpose.

Then, too, it might be mentioned that the English sparrow is used for food by some people, and is sold in some of the markets in various parts of the world. Someone has thoughtfully suggested that this is probably the only way we shall ever get rid of this pesky fellow. Well, you can have my share!

TRAVELING HOUSES

SOME animals have permanent homes and spend their entire lives in the vicinity of one place. Some others have no homes at all, and roam about the country in a care-free way. Still others carry their homes with them, and are at home "wherever they take off their hats." Like the proverbial sailor who is at home wherever he anchors, these animals are at home wherever they stop.

The snail is one of the most common animals of this last type. It builds its house by a secretion of its own body, which hardens and becomes the shell. This house fits the body like a tailor-made suit, and the snail is always comfortable in it. The snail and the shell are inseparable. It cannot leave its shell as does the hermit crab.

The shell is the snail's greatest protection. If danger arises, Mr. Snail quickly draws himself inside and closes the door with his large flat foot, just as we might bar the windows of a house. He can remain inside his house for weeks, if necessary, without danger of death. In dry weather, he may go inside his shell, and "close up shop" until rains come. In this way, he protects himself from the hot sun, and also preserves the moisture of his own body. I have kept them in this condition (known as "aestivation") for several months without their dying.

When snails first hatch, the house is very small, and there is only one "turn" in the shell. As the snail grows larger, the shell enlarges by adding to the old part and, in this way, the opening is kept as large as the snail's body.

These animals have only one foot, and they crawl along on this while they balance their houses on their backs. Some animals with many feet have less to carry than the snail has with only one foot. The foot is wide, and creeps along slowly. A sticky substance is secreted at the front end, so that a slippery path is made for the foot to slide along on. It is easy to trace the path of a snail by following this trail which is left behind.

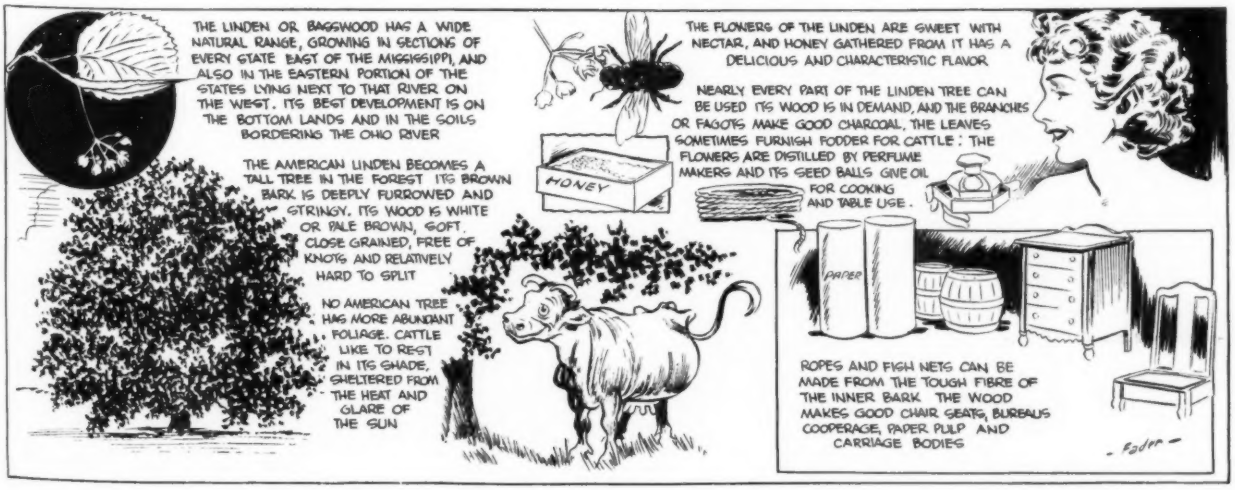
Snails are very slow, and never seem in a hurry. They do not have to get home before dark, for their home is on their back. They never leave home, so they never have to go home. They nibble on tender leaves here and there, and keep their eyes open for their enemies. Their eyes are located on the tips of their long feelers, and these can be stretched out or drawn in at will. One eye can be "poked" over the top of a leaf to look for enemies, while the rest of the body is hidden. It is believed that the shorter pair of feelers is used for smelling.

Snails are found in widely different places. No other living animals have a greater range. They are found above the snow line in the Himalayas, and they cover all ranges down to 16,000 feet or more below the surface of the sea. Perhaps one reason for this unusually wide range is the fact that they carry their homes with them.

Another common animal which always carries its house on its back is the turtle. This animal, likewise is able to withdraw inside its shell in time of danger. It travels much faster than the snail, for (*Continuing on page* 303)

TREES AND THEIR USES

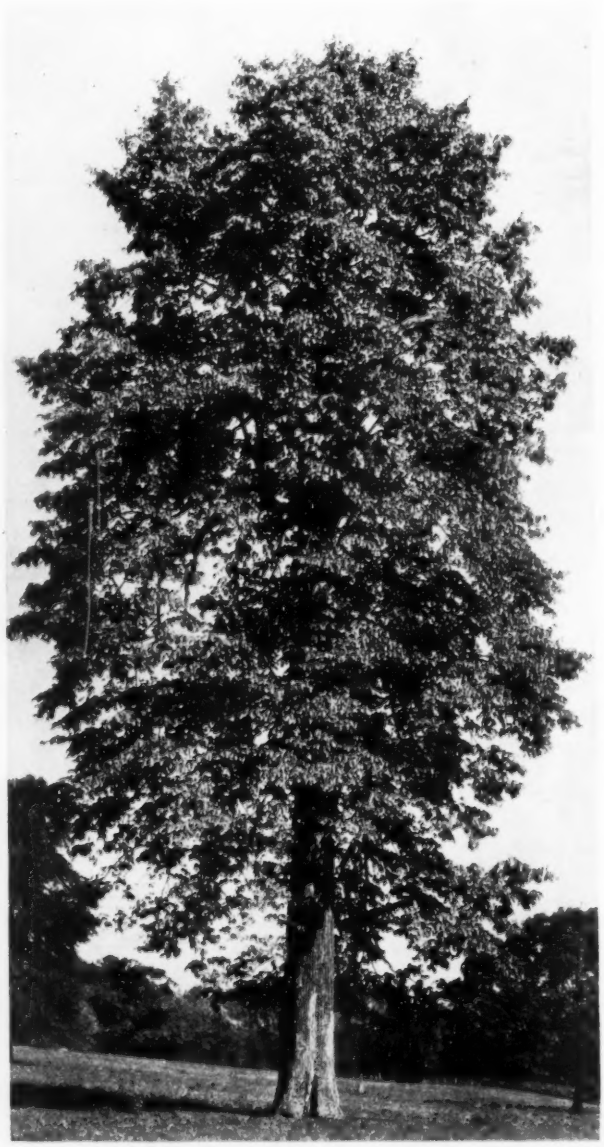
No. 6 - - - BASSWOOD or LINDEN


THE LINDEN OR BASSWOOD HAS A WIDE NATURAL RANGE, GROWING IN SECTIONS OF EVERY STATE EAST OF THE MISSISSIPPI, AND ALSO IN THE EASTERN PORTION OF THE STATES LYING NEXT TO THAT RIVER ON THE WEST. ITS BEST DEVELOPMENT IS ON THE BOTTOM LANDS AND IN THE SOILS BORDERING THE OHIO RIVER
THE AMERICAN LINDEN BECOMES A TALL TREE IN THE FOREST. ITS BROWN BARK IS DEEPLY FURROWED AND STRINGY. ITS WOOD IS WHITE OR PALE BROWN, SOFT, CLOSE GRAINED, FREE OF KNOTS AND RELATIVELY HARD TO SPLIT
NO AMERICAN TREE HAS MORE ABUNDANT FOLIAGE. CATTLE LIKE TO REST IN ITS SHADE, SHELTERED FROM THE HEAT AND GLARE OF THE SUN
THE FLOWERS OF THE LINDEN ARE SWEET WITH NECTAR, AND HONEY GATHERED FROM IT HAS A DELICIOUS AND CHARACTERISTIC FLAVOR
HONEY
NEARLY EVERY PART OF THE LINDEN TREE CAN BE USED. ITS WOOD IS IN DEMAND, AND THE BRANCHES OR FAGOTS MAKE GOOD CHARCOAL. THE LEAVES SOMETIMES FURNISH FODDER FOR CATTLE: THE FLOWERS ARE DISTILLED BY PERFUME MAKERS AND ITS SEED BALLS GIVE OIL FOR COOKING AND TABLE USE.
PAPER
ROPES AND FISH NETS CAN BE MADE FROM THE TOUGH FIBRE OF THE INNER BARK. THE WOOD MAKES GOOD CHAIR SEATS, BUREAUS COOPERAGE, PAPER PULP AND CARRIAGE BODIES
- Fodor -

BASSWOOD

Tilia glabra. Ventenat

THE northern basswood, American linden, or lime, forms a compact symmetrical tree usually seventy to ninety feet high with a trunk two or three feet in diameter. Occasional trees 140 feet high with maximum trunk diameters of four and one-half feet have been reported.



Northern basswood forms a handsome, compact, narrow crowned tree from fifty feet to occasionally one hundred feet high, with a full, symmetrical trunk two to three feet in diameter.

It is distributed over much of the eastern half of the United States and north into New Brunswick to the eastern shores of Lake Superior. Its southern range is confused with that of the white basswood, *Tilia heterophylla,* which differs, among other features, in the leaves which are silvery white and covered with fine hairs on the lower surface. The largest and most vigorous trees are found in fertile coves and on low land near streams within the central states. It grows in mixture with other hardwoods and does not form pure stands.

This is the tree for which *Tilia americana* as given by Linnaeus was long supposed to be correct. *Tilia glabra,* as credited to the French botanist Etienne-Pierre Ventenat, probably refers to the smooth surfaces of the simple alternate, heart-shaped leaves. The upper surface is dull dark green, and the lower surface paler with occasional tufts of rusty brown hairs in the axils of the principal veins.

The perfect five-petaled, fragrant, white or cream-colored flowers appear after the leaves are fully developed in June and early July. By early October gray, woody, spherical fruits about the size of a pea develop from the fertile blossoms and hang singly or in clusters from a stalk attached about midway to a leafy bract.

The buds are dark red or sometimes greenish. While without distinctive flavor, they become mucilaginous

Numerous slender branches, of which those at the base of the tree are strongly drooping, become revealed when the leaves have fallen.

when chewed. The dark gray bark of old trees is about an inch thick, deeply furrowed into narrow, flat-topped firm ridges with characteristic horizontal cracks. That of young trees is gray, smooth and thin. The bast fibres of the inner bark have long been used in making cords, fish nets, mats and similar articles.

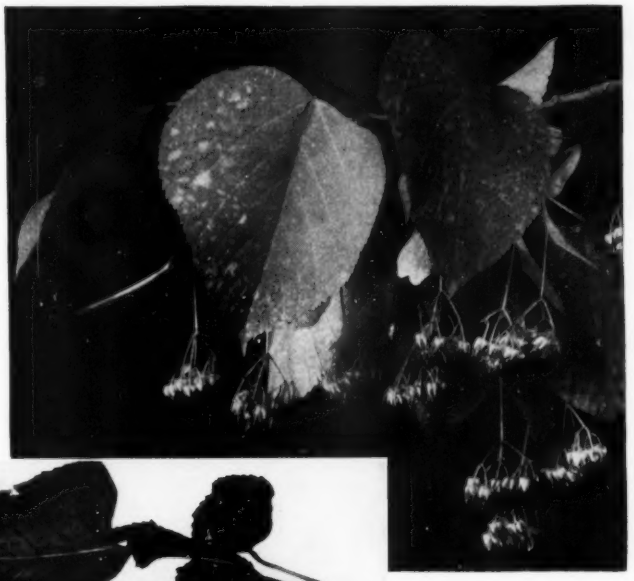
The white to creamy-brown wood is valued for its white color, light weight and good working qualities and is used widely for wooden ware, slack cooperage, boxes, veneer, excelsior, paper pulp, and many small articles. When air-dry it weighs about twenty-six pounds to the cubic foot.

Nine billion board feet of basswood are estimated to be growing in the United States, of which about five billion board feet are in the Lake States and two billion feet in the high lands of West Virginia, Kentucky and Tennessee. The basswood lumber production of 37,282,000 board feet in 1933 shows a sharp reduction from 133,320,000 board feet cut in 1929, and about 400,000,000 board feet cut during the years 1906, 1907 and 1909.

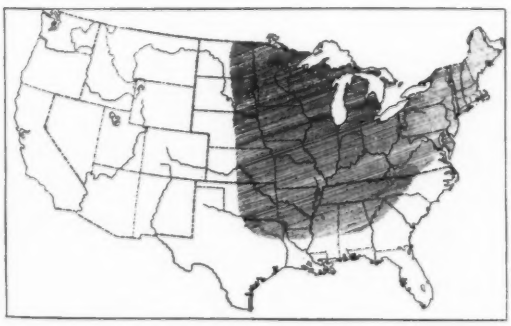
It grows rapidly, develops from stump sprouts as well as from seeds. Trees mature at from ninety to 140 years, and when crowded by other trees form straight stems with clear lengths of fifty to seventy feet.

While the leaves are frequently disfigured by insects, the tree seldom succumbs to their attacks. Fire often causes hollow butts and permits the entrance of wood-destroying fungi.

Throughout eastern United States basswood adapts itself to difficult conditions and is frequently recommended for city streets. It is also satisfactory on the Pacific slope.



The broad, heart-shaped leaves are smooth on the under as well as the upper surface, bear coarse teeth on the margins and taper rapidly to a point. Scarcely have the leaves fully formed when clusters of white or creamy five-petaled perfect flowers appear suspended from a leafy bract (upper picture). By early autumn many of these have developed into woody fruits (lower picture) about the size of a pea. Without a true terminal bud, the smooth dark red lateral buds are about a quarter inch long and are arranged alternately on the twig (right).



Natural range of basswood within the United States.

The deeply furrowed bark is about an inch thick.

AROUND THE STATES
WITH
THE AMERICAN FORESTRY ASSOCIATION

Work Relief Funds Allocated

Half of the money earmarked by Congress for each of several types of work contemplated under the Work Relief Act was segregated on May 7, following the first meeting of President Roosevelt's Advisory Committee on Allotments. It was distributed according to the following classes, but no allotments to individual projects were made:

Highways, roads, streets and grade-crossing elimination, $400,000,000; rural rehabilitation, water conservation, trans-mountain water diversion and irrigation and reclamation. (This is the money allotted to Under-Secretary Tugwell, whose Resettlement Administration has been set up separately from the Work Relief Administration), $250,000,000; rural electrification, $50,000,000; housing, $225,000,000; assistance for educational, professional and clerical persons, $150,000,000; Civilian Conservation Corps, $300,000,000; loans or grants for projects of States, Territories, etc., and self-liquidating projects of public bodies thereof, $450,000,000; and sanitation, prevention of soil erosion, prevention of stream pollution, seacoast erosion, reforestation, forestation, flood control, rivers and harbors and miscellaneous projects, $175,000,000.

Lump sums have been segregated to the several divisions without immediate plans for their subdivision. For example, no specific allotment has been made for Dutch elm disease control, white pine blister rust control, for improvements on National Forests, for continuation of the forest purchase program, or for expansion of the soil erosion program. All of these and others are expected.

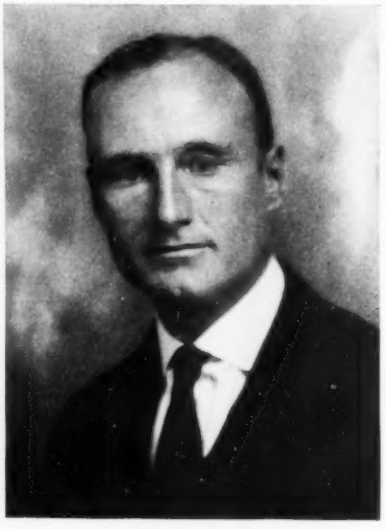
Projects will be concentrated in areas where the largest numbers of unemployed are found. Also, wherever possible those on relief will receive preference in obtaining jobs; the idea behind the entire program is to give work to 3,500,000 people on relief as soon as possible.

The committee, which is expected to meet once or twice each week until the entire $4,880,000,000 has been allotted, consists of about twenty members with Secretary Harold L. Ickes, of the Department of the Interior, serving as Chairman. Other members include the Secretaries of Agriculture and of Labor, Harry L. Hopkins, Works Progress Administrator and Director of the Federal Emergency Relief Administration, Under-Secretary Rexford G. Tugwell, Frank H. Walker, Director of the Division of Applications and Information, F. A. Silcox, Chief Forester, Thomas H. MacDonald, Chief of the Bureau of Public Roads, and Edward A. O'Neal, President of the American Farm Bureau Federation.

The Resettlement Administration to have general charge of approved projects under the Work Relief Act dealing with soil erosion, stream pollution, reforestation, forestation, flood control, rural rehabilitation and reclamation was announced by President Roosevelt on April 30 with the statement that these will be under the direction of Dr. Rexford G. Tugwell. The responsibilities of Administrator of Resettlement will be separate and apart from those of Under-Secretary in the Department of Agriculture.

Dr. Tugwell will have charge of several Federal land buying agencies acquiring submarginal acreage and under the law will have power to purchase or condemn land as needed for his operations. Nearly 7,000,000 acres have thus far been purchased or placed under option in the land program.

Dr. Tugwell's new duties were outlined in the executive order as: To administer approved projects involving resettlement of destitute or low-income families from rural and urban areas, including the establishment, maintenance and operation in such connection of communities in rural and suburban areas; to initiate and administer a program of approved projects with respect to soil erosion, stream pollution, seacoast erosion, reforestation, forestation and flood control; to make loans as authorized under the said emergency relief appropriation act of 1935; to finance, in whole or in part, the purchase of farm lands and necessary equipment by farmers, farm tenants, croppers or farm laborers.



William P. Wharton

Wharton Named President of Parks Association

William P. Wharton, of Groton, Massachusetts, was elected president of the National Parks Association to succeed Dr. Cloyd Heck Marvin, President of George Washington University, at a meeting of the Executive Committee on May 13. Mr. Wharton is a director of The American Forestry Association, and has long been associated with the National Association of Audubon Societies.

At the same meeting the election of Dr. Frederick V. Coville, as vice president, was announced. Albert W. Atwood was named secretary of the Association, and Robert Sterling Yard, editor. The Executive Committee was named as follows: William P. Wharton, Albert W. Atwood, Wallace W. Atwood, Frederick V. Coville, Henry W. deForest, Francis W. Goodwin, Casper W. Hodgson, Cloyd Heck Marvin, Robert Marshall, Henry Baldwin Ward, and Robert Sterling Yard.

38,000,000 Visit National Forests

An all time high in numbers of visitors to the National Forests was recorded last year, according to Forest Service. The complete estimate of visitors, compiled from National Forest and regional reports for the fiscal year 1934, shows that 38,037,200 persons visited the National Forests compared with 34,672,100 in 1933. Continued heavy recreational use of the forests indicates that the total of visitors during the current year will at least equal, and probably exceed, last year's figures.

Approximately 8,500,000 of the National Forest visitors were special use permittees and guests, hotel and resort guests, campers and picnickers. More than 4,000,000 others came to the forests primarily to enjoy the scenery, hiking, or riding, and approximately 24,000,000 were transient visitors passing through the National Forests.

The estimated totals for the different classes of visitors for the 145 National Forests were as follows: Special use permittees and guests, 613,500; hotel and resort guests, 1,014,000; campers, 2,343,100; picnickers, 4,610,200; motorists, horsemen, hikers, etc., 4,642,500; and transients, 24,813,900.

The numbers of campers, picnickers, motorists, and special use permittees increased over 1933 but there were fewer resort guests.

National Forests of Region 5—California—had the largest number of visitors of any region, a total of 17,879,000.

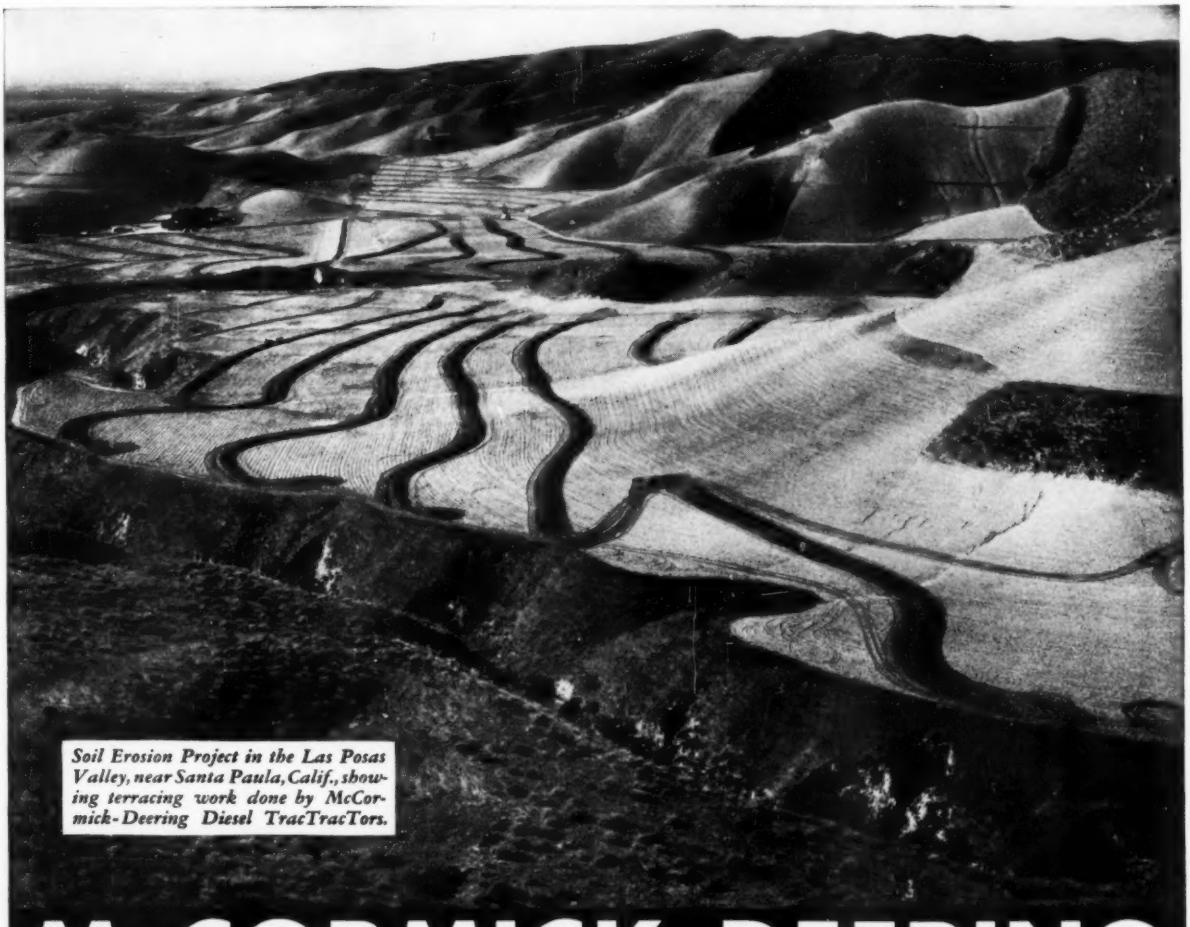
"Department of Conservation and Works" Proposed

The possibility of transferring the Forest Service, the Biological Survey, the newly authorized Soil Conservation Service and any other agency "of the Government engaged in conserving the natural resources or in carrying on public works activities" from the Department of Agriculture was revived on April 24 when Senator J. Hamilton Lewis, of Illinois, introduced S. 2665 proposing to change the name of the Department of the Interior to the Department of Conservation and Works.

In introducing the bill, Senator Lewis said it "was handed me by the Secretary of the Interior, * * * and I am authorized to announce that the President of the United States has had consideration of the bill, knows the policy of it and approves its purposes."

At a public hearing on May 16, Secretary Ickes said that the new name would be more indicative of the normal function of the Department of the Interior. "Reorganization, however, is a gradual process that can only be effectuated by time and careful study," he said. "It is not the purpose of the present bill or of this report to propose any transfer of specific activities, but rather to present the need for more clearly identifying the Department of the Interior with its primary functions, leaving to the President and the Congress such unification of conservation and public works activities within the Department as may be practicable in the logical rearrangement of government business."

The Secretary defined the conservation of natural resources as "their prudent use in the interest of the country."



Soil Erosion Project in the Las Posas Valley, near Santa Paula, Calif., showing terracing work done by McCormick-Deering Diesel TracTracTors.

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CRAWFORD TO ADMINISTER FOREST CODES

That affairs of the Lumber Code may be dealt with promptly and effectively, and to carry out an amendment generally known as Article XIX, proposing that all actions of the Lumber Code Authority, all changes in the Code and in the standards or methods of forest practice shall be approved by the National Recovery Administration Board before becoming effective, Colonel C. H. Crawford, formerly a consulting engineer in New York City, has been appointed administrator for N.R.A. of the Forest Industries Codes.

According to David T. Mason, Executive Officer of the Lumber Code Authority, this proposed change will have no effect upon the policy of self-government by the industry, but merely authorizes the National Recovery Administration to exercise its approval and veto power before, rather than after, actions of the Code Authority are made effective.

While the Lumber Code will be continued on a voluntary basis pending action by Congress on legislation continuing the National Recovery Act, representatives of the N.R.A. have given assurance that non-complying manufacturers of lumber will be barred from participation in any Federal Government purchases of lumber. It was explained that this ruling will extend to projects which are financed with Federal funds borrowed from the Reconstruction Finance Corporation or other Federal lending or administrative agencies.

The draft of Article XIX as submitted to the industry is as follows:

"Notwithstanding any other provisions of this Code to the contrary, no (a) rule or regulation (except procedural rules and regulations of the Authority or any agency established under this Code); (b) restriction; (c) trade practice; (d) interpretation; (e) requirement of reports; (f) standards or methods of forest practice; (g) authorization or relaxation relieving any person from any provision of this Code; (h) approval or disapproval; (i) exemption or exception; (j) establishment of a division or subdivision or designation of the agency or governing body thereof, or the territory or persons subject thereto, or removal of such agency or governing body; and (k) action on or determination of any matter relating to production control under the provisions of Article VIII or Schedule A of this Code, shall become effective or constitute a provision of this Code within the meaning of Sections 3 (b), 3 (c) and 3 (f) of the National Industrial Recovery Act, until after the approval thereof by the National Industrial Recovery Board, after such notice and opportunity to be heard, if any, as said Board deems necessary."

C.C.C. EXPANSION GETS UNDER WAY

The machinery for expansion of the Civilian Conservation Corps to a peak strength of 600,000 men was set in motion by President Roosevelt early in May. At his direction, Robert Fechner, director of Emergency Conservation Work, called upon all cooperating departments to speed up activities so that the Corps will be operating at full strength by August 31.

The War Department immediately issued instructions to commanding officers of all corps areas to begin the enrollment of new men on June 15. At the same time plans were initiated for a construction program providing for the building at once of 1,276 new C.C.C. camps at a cost of $25,000,000.

To carry out the President's program on schedule time, it will be necessary for the Labor Department and the Veterans' Administration to select and the War Department to enroll 250,000 new men and an estimated 100,000 replacements during June, July and August.

The locations of the 2,916 camps, 1,276 of which will be new, and each with a full strength of 200 men, have been approved by Director Fechner as follows:

Alabama, forty-seven camps, an increase of twenty-three; Arizona, fifty-nine camps, an increase of thirty-seven; Arkansas, sixty-three camps, an increase of thirty; California, 160 camps, an increase of sixty-eight; Colorado, forty-four camps, an increase of twelve; Connecticut, twenty-three camps, an increase of seven; Delaware, eight camps, an increase of five; Florida, thirty-four camps, an increase of eleven; Georgia, sixty-two camps, an increase of twenty-eight; Idaho, ninety-two camps, an increase of twenty-six; Illinois, 103 camps, an increase of twenty-nine; Indiana, sixty-two camps, an increase of thirty-five; Iowa, fifty-five camps, an increase of twenty-three; Kansas, twenty-seven camps, an increase of six; Kentucky, fifty-four camps, an increase of twenty; Louisiana, fifty-one camps, an increase of twenty-six; Maine, nineteen camps, an increase of four; Maryland, thirty-five camps, an increase of twenty; Massachusetts, sixty-one camps, an increase of twenty-seven; Michigan, 109 camps, an increase of fifty-one; Minnesota, 104 camps, an increase of thirty-six; Mississippi, fifty-seven camps, an increase of twenty-three; Missouri, sixty-nine camps, an increase of twenty-eight; Montana, thirty-five camps, an increase of eight; Nevada, twenty-three camps, an increase of seventeen; New Hampshire, twenty-six camps, an increase of thirteen; New Jersey, forty-eight camps, an increase of twenty-two; New Mexico, thirty-seven camps, an increase of twenty-one; New York, 134 camps, an increase of sixty-six; North Carolina, seventy-eight camps, an increase of thirty-nine; North Dakota, twenty camps, an increase of seven; Ohio, seventy-three camps, an increase of thirty-seven; Oklahoma, fifty-one camps, an increase of twenty-nine; Oregon, seventy-five camps, an increase of thirty-six; Pennsylvania, 138 camps, an increase of forty-one; Rhode Island, seven camps, an increase of four; South Carolina, forty-nine, an increase of twenty-six; South Dakota, twenty-nine camps, an increase of three; Tennessee, twenty-nine camps, an increase of five; Texas, ninety-six camps, an increase of forty-three; Utah, forty-two camps, an increase of twenty-four; Vermont, forty-two camps, an increase of seventeen; Virginia, ninety-five camps, an increase of thirty-two; Washington, seventy-seven camps, an increase of thirty-five; West Virginia, fifty-one camps, an increase of thirty-one; Wisconsin, 103 camps, an increase of forty-eight; Wyoming, thirty-two camps, an increase of thirteen. The number of camps in the District of Columbia and Nebraska had not been finally approved.

Of the total number of camps, according to Mr. Fechner, approximately 650 will be located on the National Forests of the country, 500 on soil erosion projects, 420 in state parks, 325 in state forests, 250 on private forests, 100 in National Parks, seventy-five on military and naval reservations, fifty on projects supervised by the Division of Grazing Control of the Department of Interior, fifty on reclamation projects, thirty on Tennessee Valley Authority projects, twenty-five on wildlife projects supervised by the Biological Survey, and the remainder on drainage, flood control, mosquito control, Land Office, War Department, Plant Industry and other special governmental projects.

How DYNAMITE helps protect the Nation's Forests

Tap-rooted stump heaved out by dynamite and ready for easy disposal.

FIRE LANES being cut through forests by workers in CCC Camps will save untold millions of trees from destruction by fire.

These lanes—checkerboarded through the woods—not only tend to restrict fires to the "blocks" in which they start, but permit the rushing of fire-fighting apparatus to hitherto inaccessible parts of wooded areas.

The removal of stubborn green stumps could easily be the hardest job in the cutting of fire lanes. But the use of dynamite has made it one of the easiest.

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AMERICA BUILDS FIRST ALL-WOOD RADIO TOWER

Broadcasting from an all-wood radio tower, the first of its kind to be built in America, was formally inaugurated late in April by Station WRVA, at Richmond, Virginia.

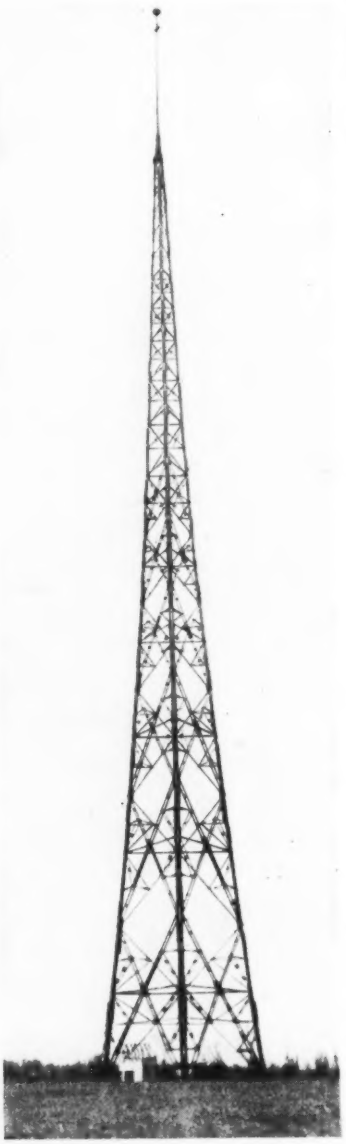
The new structure is a gigantic tripod, constructed throughout of wood, and rises 320 feet from the ground to support WRVA's vertical broadcasting antenna. Although wood has been long in favor as a material for radio towers in Europe because of its non-interference with broadcasting, this is the first instance of the construction of an all-wood radio tower of anything approaching such height in America.

The use of wood for such a purpose is made possible through a simple contrivance called the modern timber connector developed abroad from an idea conceived in this country several decades ago. Its value to construction engineers lies in its ability to distribute the "load" at a timber joint, dividing the burden by transmitting it from one wooden timber to another.

This ingenious, though simple, contrivance has gone far toward solving the problem which confronted designing engineers in their endeavor to make the old-fashioned timber joint as strong as a cross section of the timbers composing it. It was impossible, with the limitations of the old-fashioned bolted joint, to utilize the full strength or "allowed working stress" of the timbers, because to do so would entail the use of pieces so small that sufficient area would not be provided for the necessary number of bolts at the joint. As a result designers were compelled to specify heavy and cumbersome timbers, which resulted frequently in making wood an impractical material. With the modern timber connector, however, no such area at joints is necessary, and wood frame structures are enabled to present the lacy appearance usually attributed only to steel framework. As wood is, pound for pound, as strong as steel, it will be seen that the timber connector device makes it available for use in numberless structures where other materials were formerly thought essential.

There are several types of these connectors, which were introduced into this country from Europe, where they were proving highly successful, by Axel H. Oxholm, Chief of the Forest Products Division of the Department of Commerce. There are two timber connectors commercially important in this country—the "alligator" and "split-ring." The first is a toothed ring of corrugated steel which is placed between adjacent surfaces of two timbers forming a joint in such a way that it encircles the bolt hole. As the timbers are pressed together by the tightening of the bolt the connector is imbedded in the wood to half its depth in each piece. It then carries the load of the joint, the bolt serving merely to hold the assembly together.

The other type is the "split-ring" connector, which is a smooth circlet of steel with a tongue - and - groove break. A simple cutting tool which works from the bolt hole carves a groove half the width of the ring in depth in the faces of each of two timbers forming a joint. The ring is then placed in the groove and, as in the case of the toothed connector, the bolt functions only to hold the pieces together. Flexibility provided by the tongue - and - groove break enables the "split-ring" connector to bear against the encircled core as well as against the outer edges of the groove.



America's first all-wood Radio Tower at Richmond, Virginia.

The tripod or triangular idea which makes WRVA's new tower differ so radically from the ordinary square base or four-legged affair, is American in both its origin and development. The triangular feature is valuable in that it reduces resistance to the wind and enhances the economy factor, as it decreases by approximately twenty-five per cent the amount of lumber needed.

The corners of WRVA's tower are thirty-eight and one-half feet apart at the tops of the foundation piers. From this the structure tapers to a point where, 280 feet above the ground, the corners are but fifteen inches apart. The balance of the height is attained by a flag staff which thrusts upward forty feet from the apex of the tower proper.

The WRVA tower was designed by Frank P. Cartwright and checked by Peter Landsem, engineers associated with the National Lumber Manufacturers Association. The connectors were supplied by the Timber Engineering Company—a promotional subsidiary of the American Forest Products Industries.

Favor State Forest Bill

Explaining in a favorable report dated May 6, that the Fulmer bill, H. R. 6914, will help the states acquire forest lands under a long-time payment system, which will pay back to the Federal Government the amount of money spent for the lands, the House Committee on Agriculture urged its passage by Congress. A companion bill, S 2739, was introduced on May 2 by Senator Royal S. Copeland, of New York.

The report explained that under this bill a number of small areas may be set up so that participation in the forestry program will be distributed over the state. These widely scattered small areas within the state will act as demonstration areas, show how timberland should be managed and developed, and will serve as a laboratory station from which private owners may obtain valuable knowledge.

"Further," continued the report, "forest lands owned by the state may be used for the establishment of Civilian Conservation Corps camps for practically any kind of work of public interest."

With favorable action by the Rules Committee it is expected the bill will soon be considered on the floor of the House.

"Industroforestry" Wins Forestry Term Contest

The word "Industroforestry" has been awarded first prize in the competition conducted by The American Forestry Association for the best word or phrase to distinguish commercial forestry from non-commercial forestry. "Industroforestry" was submitted by two contestants, Leland F. Allen, of Ogden, Utah, and Arthur F. Roberts, of Seattle, Washington. Each received an award of $25.

More than six hundred words and terms were submitted in competition. The contest opened January 1 and closed March 31.

The words "industrial forestry" are combined to form "industroforestry" which describes the economic growing of forest trees to be harvested on a profitable basis like any other crop. Although a long word, the judges concluded it to be euphonious, scientific and easy to understand.

It was the feeling of the donor, a member of The American Forestry Association who prefers to remain unknown, that the term "forestry," which is applied to the administration of uneconomic forests as well as to commercial forests, was too indefinite to clearly differentiate the two broad objects of forest management. In the interest of clearer public understanding and advancement of industrial forestry, it is believed a new word or term should be coined that will more sharply and definitely express its meaning and significance.

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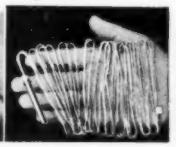
Simple pressure of the fingers breaks package open along indented line—and cap is ready for use.

The wires are kept folded accordion-wise so that they extend naturally into position.



It is easy to straighten out the cap end for priming without disturbing the rest of the accordion fold.

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STUDIES COMPLETED FOR SHELTERBELT

Preliminary field studies have been completed by investigators in the Prairie Shelterbelt organization, according to Paul H. Roberts, Acting Director of the project. These studies will be assembled in a comprehensive report as the basis for conducting all field work.

Moisture is clearly the primary limiting factor in the planting of trees in the zone chosen for this project, Mr. Roberts says, and the selection of proper soil types is the major problem in this connection, since soil is the medium through which moisture is furnished to the tree roots. A soil survey has been made, and records compiled, to serve as a basis for the final adjustments in the boundaries of the zone and the determination of specific sites for shelterbelts within the zone.

Surveys of native vegetation have also been made, particularly with regard to trees that can be used as a source of seed in producing nursery stock suited to the conditions under which planting is to be done. The growth and history of existing plantations have also been investigated.

Records of the Weather Bureau and other Federal bureaus, particularly those of the Department of Agriculture, also records of research work carried on by state agricultural colleges, extension services, and other state departments, have been studied so that the present investigative work in the field could be correlated with scientific data accumulated in the past.

Sites for shelterbelts to be planted this spring have been selected. They are located in Texas, Oklahoma and Kansas, and are within the limits of a zone, the present location of which has been determined in accordance with the investigations of the past winter. In some states the planting sites will be grouped more than in others, but the areas to be planted in each will be the same as far as conditions permit. The exterior limits of the zone itself are subject to adjustment, and, pending final adjustment, some experimental planting may be done outside them, it was announced.

FIGHT ON ELM DISEASE CONTINUES

The first phase of the fight against the Dutch elm disease was concluded on April 13 with the destruction of the last of 7,786 trees known to have been infected.

This does not mean, says Lee A. Strong, Chief of the Bureau of Entomology and Plant Quarantine, of the Department of Agriculture, that the Dutch elm disease has been stamped out in the United States. Undoubtedly, he says, some diseased elms were missed during the survey last summer. The external symptoms of chronic infections may have failed to develop, or they may have been masked. Moreover, the condition of many trees infected in 1934 will not become apparent until the leaves come out this spring.

All weakened or dead elms in the infected region—5,000 square miles in New York, New Jersey and Connecticut, centering around New York City—are potential sources of infection and are possible breeding places for elm bark beetles now known to be carriers of the fungus that causes the disease. More than 300,000 of these valueless trees have been removed and about the same number have been marked for removal.

Scouts are continuing the survey of elms in the infected zone begun in 1933 when the disease was discovered in New Jersey. Each dying tree will be tagged for prompt removal.

Cities to which imported burl elm logs have been delivered and land along the railroads over which these logs traveled will also be surveyed. Burl elm logs imported from Europe by manufacturers of veneer are believed to have been a means of introducing the Dutch elm disease into the United States. The importation of such logs is no longer permitted.

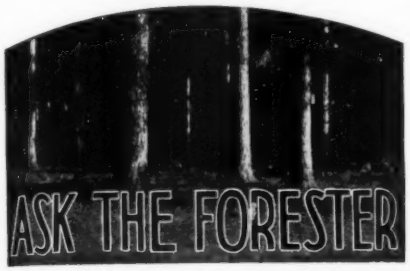
N.L.M.A. TAKES FEDERATION FORM

A federation of the lumber manufacturing industry was virtually achieved on April 27 when the National Lumber Manufacturers Association, holding its annual meeting in Chicago, voted to resume its federated form. The new federation will be based on fifteen or sixteen regional and species associations of manufacturers, and the National Lumber Manufacturers Association will hereafter conduct all activities relating to general lumber industry affairs and protective and general lumber promotion. John W. Watzek, Jr., of Chicago, was elected president of the Association, succeeding C. C. Sheppard.

Under the new federation the Timber Engineering Company will continue as a subsidiary of the American Forest Products Industries, which held meetings at the same time. On the point of trade promotion a resolution adopted by the directors of the National Lumber Manufacturers Association states that the American Forest Products Industries will remain "as a convenient separate agency through which any interested associations or groups of individual companies may from time to time conduct cooperatively any further specific lumber promotion projects for which they will provide the necessary financial support." Further, the resolution states that "to the largest practical extent the desirable national promotional activities should be conducted directly by the National Lumber Manufacturers Association and financially supported by national dues paid uniformly by all regional associations." The practical extent of such uniform support is now limited to a comparatively narrow range of defensive and protective activities. It is recognized, therefore, that "it is important to the progress of the industry and to the extended use of lumber and timber products that this special facility be maintained and that its activities be more generally supported by interested associations and lumber companies." During the next six months, however, pending full financial affiliation of the regional associations, subscriptions are to be continued from individuals in any region not affiliated whether represented at the present time by a regional association or not."

The meeting also adopted two amendments to the Lumber Code, one requiring approval by the N.R.A. of actions of the Code Authority before they become effective, and the other establishing a Lumber Code seal and requiring its application to all lumber and timber products sold to the Federal Government or shipped in interstate commerce. These amendments were ordered to be sent to the divisions for consideration and action.

In addition to President Watzek, the following officers were elected: vice president and treasurer, W. M. Ritter, Washington, D. C.; vice presidents, W. B. Nettleton, Seattle, Washington, J. F. Coleman, Kinzua, Oregon, and Ernest Kurth, of Keltys, Texas. Wilson Compton, of Washington, D. C., was renamed secretary-manager.



Forestry Questions Submitted to The American Forestry Association, 1713 K St., N. W., Washington, D. C., will be Answered in this Column. . . . . A self-Addressed Stamped Envelope Accompanying Your Letter will Assure a Reply.

✣ ✣ ✣

QUESTION: Can spring blooming shrubs like lilac be pruned while in leaf or should I wait until fall?—T. D. G., West Virginia.

ANSWER: Japanese quince, lilacs, mock orange, spirea Van Houtte, golden bell and other shrubs which bloom in early spring should be pruned immediately after they have completed blooming. This will permit new growth during the summer to set buds for the succeeding year's flowers.

QUESTION: I am ambitious of being a Forest Ranger and I hope to learn through experience gained in the Civilian Conservation Corps. I have written a correspondence school. They say that they can train young men for Civil Service Exams in forestry. My request is that you look at the literature they sent me and give me your honest opinion about their courses.—R. B., Illinois.

ANSWER: Upon inquiry it was learned that the course consists of questions prepared by the school which are answered with transcripts of portions of free Government pamphlets. As a training for the practice of forestry the course is worthless.

Furthermore, many correspondence school students are hampered by the law requiring forest rangers to be selected, when practicable, from among qualified citizens who live in States which have National Forests, and who shall be appointed to a forest located in the State where they reside. Examinations are held only in States which have National Forests.

There are schools connected with standard colleges or universities requiring resident study which give ranger courses in forestry. Their courses can in no way be compared with correspondence courses.

QUESTION: Can the exact age of a tree be told from the seasonal rings visible in a cross section of the trunk?—R. L. R., Wisconsin.

ANSWER: Ordinarily, the exact age of a tree can be told by counting the annual or seasonal rings on the cross section of the lower portion of the trunk. However, because the tree is cut several inches above the ground allowance of one or more years must be made to include the growth from seed to the height of the stump. Occasionally seasonal conditions may cause an extra growth ring in the same summer. These are usually less distinct than the full year's ring and ordinarily can be distinguished from them.

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FORESTRY IN CONGRESS

By G. H. COLLINGWOOD

The Agricultural Appropriation Bill as finally agreed to by both Houses of Congress and signed by President Roosevelt contains Senate increases which affect research in forestry and bring the total appropriation for the Forest Service to $11,600,973. This increase of nearly $3,000,000 over the current year does not reflect the actual development of forest work as covered by emergency allotments so large as to completely overshadow this relatively large sum.

Senate increases to the Biological Survey finally approved by the Conference Committees will give that bureau $1,396,492 for the coming year.

Chief among the increases to the Forest Service is one of $120,297 to make a total of $250,000 for expediting the progress of the nation-wide forest survey. Another item is an increase of $20,000 for range investigations on the National Forests of Montana, northern Idaho and eastern Washington, while $10,000 was added to make a total of $71,741 for investigations in the production of naval stores.

Predatory animal control work of the Biological Survey was given an increase from $453,692 to $600,000, and $55,000 was added to make a total of $222,978 for the protection of migratory birds under the Migratory Bird Treaty Act of July 3, 1918. This will permit the Biological Survey to double the present nation-wide force of twenty-two game wardens. Also, for the employment of seven additional game wardens to better enforce the Alaska game laws, $89,096 was appropriated rather than $71,596 as recommended by the House.

Other details of the Appropriation Bill as reported in AMERICAN FORESTS for April were approved by the Senate and retained in the bill when passed. These include $1,578,632 for cooperation with the states in forest fire prevention and suppression under the Clarke-McNary Law; $56,379 for cooperative distribution of forest planting stock; $56,838 for cooperative extension of farm forestry; $400,000 for planting on National Forests as authorized under the Knutson-Vandenburg Law; $504,494 for investigations in forest management at the twelve regional forest experiment stations, with $50,000 for the Institute of Forest Genetics at Placerville, California; $154,435 for investigations and experiments on the management of forest ranges; $508,361 for the work of the Forest Products Laboratory at Madison, Wisconsin; and $73,295 for forest economics studies.

A comparatively small portion of this last item will provide for forest studies looking toward a cooperative organization for the management of some 300,000 acres of farm woodlands surrounding Cooperstown in Otsego County, New York.

No appropriation was made for acquisition of forest lands, but ample funds are expected from the Work Relief Appropriation. The same applies to necessary funds for the control of white pine blister rust and Dutch elm disease. The work on the latter disease reached a crisis on May 14, when exhaustion of funds necessitated the temporary dismissal of over 1,100 men. This will delay the training of scouts for work during the spring and early summer. If continued long it may react critically upon the campaign to clean up all weakened and suspected elm trees within the infested area surrounding New York City.

The Appropriation Act for the Department of the Interior as signed by the President on May 9 contained provision for an Under-Secretary at $10,000 a year. Under the Act $16,199,290 is allotted to the National Park Service; $390,000 for forestry work on the Indian lands; and $250,000 to initiate administration of grazing on 80,000,000 acres of the Public Domain as authorized in the Taylor Act.

The control of soil erosion is now handled under the Soil Conservation Service whose status as a bureau in the Department of Agriculture is assured by the passage of H. R. 7054 on April 27. This supported the Executive Order whereby all soil erosion activities were transferred from the Department of the Interior to the Department of Agriculture and the present staff is to be maintained without reference to Civil Service standing for eight months. Thereafter, Civil Service status will take effect.

The Fulmer bill to aid States in acquiring land for State Forests (H. R. 6914) has been favorably considered by the Rules Committee and will probably be acted upon in the House before June first.

All action on the proposed enlargement of the Mount Olympus National Monument and its change to a National Park under H. R. 7086 has been indefinitely postponed following a series of vigorous protests from land owners and Chambers of Commerce located on the Olympic Peninsula, in Washington.

The Big Bend National Park in Brewster and Presidio Counties, Texas, was recommended by the Senate on May 1 when it passed S. 2131. The Big Bend region, according to the report submitted by the Senate Committee on Public Lands, "is the triangular portion of southwest Texas enclosed by the big bend of the Rio Grande on the east, west and south. * * * It comprises approximately 5,500 square miles. In general character it is a semi-arid plain, verging on desert, through which a group of mountain ranges, principally the Chisos, have been thrust. These constitute the southernmost spur of the Rocky Mountains. Of these, the Chisos Range 'Phantom,' the highest and most rugged, attaining an altitude of 7,835 feet, is literally a biological island. . . .

"The varied forest cover in the Chisos is still virgin. Large mammals, such as deer, bear, panther and fox, still survive. The vegetation of the surrounding semi-arid plains is principally a growth of chaparral and cactus. The forest cover, in the higher levels of the Chisos, however, is extensively varied, with Douglas spruce, pine, junipers, oaks, and hackberry well represented."

Secretary Ickes and Senator Morris Sheppard, of Texas, have suggested to the President that negotiations be arranged whereby the Mexican Government may cooperate toward the creation of an international park with similar reservations in the adjoining provinces of Chihuahua and Coahuila. Accordingly, the State Department has advised that it "will be glad to take up the matter with the Mexican Government, through Ambassador Daniels, at such time as there is definite assurance that the park on the Texas side of the Rio Grande will be created."

SAPLING SAM'S COLUMN

But Rising Temperature

Judge (in traffic court)—"I'll let you off with a fine this time, but another day I'll send you to jail."

Lumber-jack-in-town-for-a-spree—"Sort of a weather-forecast, eh, Judge?"

"What do you mean?"

"Fine today and cooler tomorrow."

—Naval Stores Review.

Mystery

An Englishman was on his first visit to America. While driving along he saw a sign that said: "Go slow; that means you."

"By Jove," said the Englishman, "how did they know I was here?"

—Log.

Don't Ask

"Dat am a fine goose, Brother Brown, wha' all did yo' git it?"

"Now Parson when yo' all preaches a specially good sermon, I never axes yo' whar yo' git it. I hopes yo'll show me de same considerashun."

Rurally Speaking

Two local farmers were gazing up at a nearly completed fire tower.

First Farmer: What's these young whippersnappers building these windmills for?

Second Farmer: Them's not windmills, Hiram. Them's water towers to put out these bresh fires.

—The Forest Pioneer.

Very Funny

"Sambo, you say youse had two onhappy ma'ges? How you mean?"

"Well, Sur, hit wuz dis way. Mah fust wife lef' me, but mah secunt wife won't."

"Did Ah heahs you say when she thows de table at you, you jes lafs?"

"Das right. An when she flings de ax at mah haid, Ah neahly splits."

—The Lumber Cooperator.

Fatherly Advice

Collegiate: "Father, I've a notion to settle down and start raising chickens."

Father: "Better try owls. Their hours will suit you better."

—Carnegie Tech. Puppet.

Adding Abuse to Injury

The motorist was hurrying and the pedestrian hadn't a chance. There was a grinding of brakes and a thump. Ten minutes later the pedestrian regained consciousness to find the motorist bending over him.

"Where am I?" he asked.

"What, don't you know?" roared the motorist, angrily. "I've lost my way, and I've been waiting all this time while you came to your senses so that you could put me right."

—Kablegram.

JULY 28th

A MEMORABLE DATE FOR TRAIL RIDERS

ON this date the Trail Riders of the National Forests will leave Chicago via the Chicago & North Western-Union Pacific, on the first leg of their adventurous journey into the wilderness of the Wind River region of Wyoming. *15 days of thrills*, into the land where Jim Bridger sought and found solitude . . . where virgin forests and majestic mountains whisper the secrets of the ages!

The Wind River country is as wild today as when the first white man penetrated its solitude. Perhaps nowhere else in America will you find the handiwork of Nature so sublime, so unspoiled

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MAY 17—*Happy Days* started its third year as the authorized weekly newspaper of the Civilian Conservation Corps. On that date the size of *Happy Days* was increased to 24 pages each week to allow more space for news, features, sketches and photographs of CCC activities and events.

To those interested in "the greatest of all peacetime movements"—the Civilian Conservation Corps—we shall be glad to send sample copies of *Happy Days* without charge.

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Charles W. Saunders Dies

Charles W. Saunders, of Seattle, Washington, a vice president of The American Forsetry Association, died at Seattle late in April.

As Chairman of the House Committee on Forestry and Logged-Off Lands of the Washington State Legislature, Mr. Saunders had been an untiring worker for forestry and conservation for many years. Going West as a young man, he practiced architecture in Los Angeles and Seattle and was one of the organizers and the first secretary of the Washington State Chapter of the American Institute of Architects. Among the many buildings which he designed was the Forestry Building at the University of Washington.

From 1903-05 he was a member of the Seattle Park Board. It was this board which instituted the present system of Seattle parks and the policy under which they are now being administered. In 1923 he was appointed a member of the Seattle Cedar River Reforestation Commission.

First Grazing Districts Under Taylor Law Authorized

Twenty-one grazing districts in Montana, Wyoming, Colorado, Oregon, California, Nevada, Utah and New Mexico, comprising the bulk of the 80,000,000 acres authorized for Federal control under the Taylor Grazing Law of June 28, 1934, have been created by order of Secretary Harold L. Ickes, of the Department of the Interior. Creation of other areas awaits passage of H. R. 3019, including an amendment to the Taylor Law authorizing Federal jurisdiction of the entire Public Domain, together with other matters relating to the prior use of the range by certain vanishing species of wildlife, and by one of the Indian tribes in Utah.

Election of district advisers from among the users of the range and the formation of local committees is expected to proceed rapidly in accordance with rules formulated by Farrington R. Carpenter, Director of Grazing, and approved by Secretary Ickes on April 23. Under these rules district advisers will meet with a representative of the Department of the Interior to recommend the issuance of grazing licenses and such special rules for range practice within the district as seem advisable. In the beginning it is expected temporary licenses without fees will be issued for approximately the same number of livestock as were grazed on the district in 1934.

Nature School on Wheels

The Western Reserve University of Cleveland, Ohio, has announced a three-weeks natural history tour into New England for August, 1935. Limited to twenty-five teachers, the tour will be under the direction of William Gould Vinal, of the School of Education.

Members of the party will become acquainted with leaders in their field, will acquire materials and skill for teaching elementary science, and will develop a better understanding of present social problems to be seen en route.

The tour starts from Buffalo, New York, on August 3, goes first to Niagara Falls, then along the Mohawk Valley, up into New Hampshire for a visit to Mt. Washington, across Maine to Bar Harbor, then down along the coast of New England to Bear Mountain, and back to Cleveland on August 23.

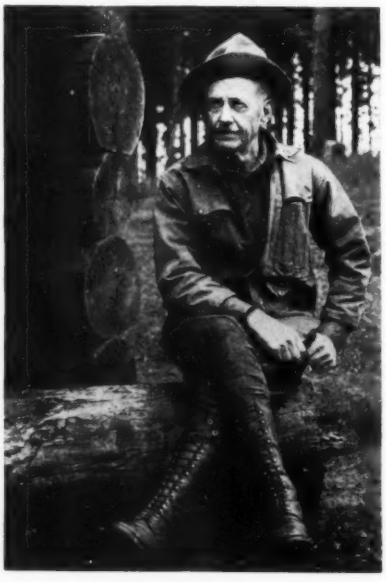
Professor Vinal's long experience as nature guide, biologist for the Massachusetts Commission on Fisheries and Game, camp director, and Scout leader makes him especially fitted to lead the tour.

George W. Peavy, of Oregon State College, Honored by Foresters

In recognition of the completion of his twenty-fifth year as dean of the School of Forestry at Oregon State College, George W. Peavy, now president of the institution as well, has been presented with a "cabin in the hills," to be built upon a site which he shall choose.

The cabin was the gift of students of the School of Forestry and graduates and friends throughout the United States. Its presentation was made as a surprise at the recent annual "fernhoppers'" banquet, attended by more than 500 foresters and forestry students.

The cabin was presented to President Peavy by Lynn F. Cronemiller, state forester of Oregon. "The group that has gathered here tonight knows you as a man, as an educator, an executive, a friend and a true forester," said Mr. Cronemiller. "And to the true forester, especially one who spends much of his time in an office, there is that ever-present desire for a sanctuary, a cabin in the woods where he can get away from the cares of his daily labors and the rush and noise of the city to some delightful spot where he can spend peaceful days and restful nights. This gift is an expression of our love and respect, an appreciation of the constructive work which you have accomplished in forestry, and in commemoration of your twenty-five years as head of the School of Forestry at Oregon State College."



George W. Peavy
President, Oregon State College

President Peavy was born in a log cabin on a farm near Howell, Michigan. He attended the traditional "little red schoolhouse," went to high school in Howell, and took his Bachelor of Science Degree at the University of Michigan, returning later for his Master's Degree in Forestry.

He then entered the United States Forest Service and in 1910 became interested in the forestry work at Oregon State College. In 1934 he was selected by the State Board of Higher Education to become president of the College, succeeding Dr. W. J. Kerr.

Charter Oak Stamp Celebrates Connecticut Tercentenary

A three-cent oblong stamp, printed in rich lilac, and bearing an engraving of the Charter Oak, was released by the Post Office at Hartford, Connecticut, on April 26 to celebrate the Connecticut Tercentenary. Since then it has been available at all post offices. The dates 1635 and 1935 appear in panels above the tree.

The Charter Oak stood in front of the old Governor Wyllys mansion in Hartford and was destroyed by a storm in 1856. It was a white oak which, according to tradition, was saved from the original forest at the request of the Indians in 1636, and in 1687 provided a cavity where was hidden for safe keeping the Charter of the Connecticut Colony, granted by King Charles II in 1662. The Charter served Connecticut as a Constitution from 1662 to 1818.

Axel H. Oxholm Joins Pacific Forest Industries

The resignation of Axel H. Oxholm as chief of the Forest Products Division, of the Department of Commerce, was announced April 30. P. A. Hayward, assistant chief, has been assigned to the position of acting chief of the Division.

Mr. Oxholm will become managing director of the Pacific Forest Industries, Inc., in Tacoma, Washington, an export corporation made up of the plywood producers in the Pacific Northwest interested in foreign markets.

The necessity for joint action in "developing foreign trade" has become increasingly apparent and the action taken by the plywood producers in the northwest is an important step in a further strengthening of our foreign trade which is in line with the recommendations of the Department of Commerce.

James F. Bogardus Succeeds Keller in Pennsylvania

James F. Bogardus, of Swarthmore, has been appointed deputy secretary of the Pennsylvania Department of Forests and Waters, succeeding John W. Keller, who has been named State Forester and director of the Bureau of Forests.

Until his appointment, Mr. Bogardus had been professor of geography at the University of Pennsylvania. Previous to that he had been a member of the faculties of the University of Cincinnati, of Swarthmore College and of Pennsylvania State College. He holds degrees from Swarthmore and the University of Pennsylvania.

Add to Hot Springs National Park

Acceptance by Secretary of the Interior Harold L. Ickes, on behalf of the United States Government, of a deed of land from Colonel and Mrs. John R. Fordyce, of Hot Springs, Arkansas, adds to Hot Springs National Park sixty-three acres of adjacent territory scenically beautiful and of ethnological importance.

During its Indian occupation the Hot Springs area was the center of the flint implement industry. The section deeded contains a quarry of novaculite, originally worked by the Caddo, Tunica and Quapaw Indians, who traded the arrowheads made from this mineral with tribes as far distant as Virginia and the Gulf of Mexico. Piles of waste chips from the nearby quarry, left by these aboriginal artificers, may be seen today by visitors to the locality.

Colonel Fordyce has made a hobby of the preserving of Indian Americana, having inherited a valuable collection of relics and archeological finds to which he has added constantly.

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The College has ample laboratories and classrooms in William L. Bray Hall and the Louis Marshall Memorial Building. It has forest properties approximating 20,000 acres that serve for demonstration, research and instruction in forestry.

Special laboratories for instruction in wood technology, in pulp and paper-making, in kiln-drying and timber-treating and a portable sawmill are other features of this institution.

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TRAIL RIDERS

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New Type of Stock Tank

Development of water on some of the dry Southwestern ranges has long been a troublesome problem. D. A. Shoemaker, Inspector of Grazing, United States Forest Service, at Albuquerque, New Mexico, has taken the lead in experimenting with new equipment.

Recently the Forest Service has taken advantage of the Civilian Conservation Corps to provide additional water on the ranges, so located as to facilitate better distribution of grazing livestock. Most of the water has been developed by customary and proven means. However, some experimental work is now being done in an attempt to avoid the extremely expensive methods of development and also to find a method whereby water can be made available where conditions are such that the usual types of development fail. One type that is now being tried out on an experimental basis is that of a shed or roof of corrugated galvanized sheet metal built on a hillside; from this the water is collected into a large storage tank. It happens that the ultimate results of this particular type of development can be calculated with reasonable accuracy, because from weather records maintained over a long period of years, the average annual precipitation is known for each general locality.

One of these experimental developments is now in course of construction on the Heber-Reno Sheep Highway, in the vicinity of the village of Heber, on the Sitgreaves Forest. The roof area is being made one hundred by one hundred and twenty feet, making a total of 12,000 square feet. The average annual precipitation at that point is approximately twenty inches, of which it is estimated that ninety per cent can be saved. This would amount to one and one-half cubic feet of water for each square foot of shed space. It is calculated that this will collect, in the average year, 135,000 gallons of water. A storage tank of 75,000 gallon capacity is being installed which, it is believed, will hold the winter precipitation until it is used in the spring, and the summer precipitation until it is used in the fall. The location which has been selected for the tank will enable drawing the water off into troughs by gravity to be controlled with an automatic flow float valve.

Mr. Shoemaker has calculated that the total cost of this development will be in the neighborhood of $2,500 whereas previous experiments have run from $5.000 to $15,000.

Stump Burner

Users of such equipment agree that the best and most efficient Stump Burner is the one built by a Tacoma, Washington, concern. The principal element of this burner is the blower, which may be driven either by an electric or gasoline motor. The blower discharges through a series of nipples, or orifices, to which air hoses may be attached. These lead to the stumps, where they are introduced into iron pipes, and the force of the air directed against the flames. On large stumps several air lines may be applied at different points to hasten combustion.

On one location a record of burning out sixty-five stumps in four hundred hours running time was reported, involving two hundred and thirteen hours of labor on the part of the operator. The power cost on this job was $4.75.

Seedling Lifter and Transplanter

Lifting and transplanting plants has been made a simple operation and one easily and quickly accomplished by the production of a new Transplanter by the Council Tool Company.

A circular steel blade or cylinder is set down around the plant and forced into the soil to a desired depth by foot pressure on the step. The Transplanter is then given a partial turn to the right which cuts the core of soil entirely free and brings the foot lever around so it can be conveniently tripped, causing the blade to grip the core and allowing it to be lifted out. In transplanting to another hole a touch of the foot lever opens the blade and releases the core containing the plant.

New Foolproof Explosive

Discovery of a new high explosive—nitro-ammonia—the first foolproof explosive, was recently announced by the Du Pont Company, Wilmington, Delaware. Twenty per cent stronger than T. N. T., the new explosive has been shot at with rifles, thrown into fires, bored with red-hot irons, subjected to blow-torches and beaten with fifty pound hammers without exploding. The only thing that detonates it is a full sized dynamite cartridge. The strongest commercial blasting caps, the anouncement states, have failed to explode nitro-ammonia.

It is called "ultimate in safety." It is even free from the headaches which dynamite causes among explosive handlers. It is a white solid. It resembles table salt caked hard, and is about the same weight. It works under water as well as in air, and does not freeze.

The technical name for it is "nitramon," which indicates its composition. This is essentially nitrate of ammonia, containing forty per cent of oxygen. The secret of its resistance to all ordinary and extraordinary methods of detonation lies in the oxygen and a special carbon compound.

The explosive was designed for blasting and stripping work.

Further information concerning any of the above products will be supplied in your self addressed stamped envelope mailed to American Forests, 1711 K Street, N. W., Washington, D. C.

Book Reviews

TREES OF NORTH AMERICA (Exclusive of Mexico), by George Rex Green. Volume II—"The Broadleaves." Published by Edwards Brothers, Inc., Ann Arbor, Michigan. 344 pages. Price $2.00.

The 512 species of broadleaved trees described in the second volume of TREES OF NORTH AMERICA by George Rex Green practically covers all trees native to continental United States. This mimeographed paperbound book has some improvements over Volume I—"The Conifers," but like that is without illustrations.

The two volumes comprise a "Who's Who" of American trees, where one may find specific references to fifty-nine oaks, twenty-seven willows, twenty-six cherries, eighteen ashes, the same number of basswoods, and thirteen maples.

The descriptions are brief, orderly and authentic. Many species are described in surprising detail, while other less important individuals may be reduced to a few lines. Its greatest use will probably be as a reference and supplement to other books on trees.
—G. H. C.

ROAMING AMERICAN PLAYGROUNDS, by John T. Faris. Published by Farrar & Rinehart, Inc., New York. 322 pages, illustrated. Price $3.00.

"There is not a state in the Union without compelling attractions. From Maine to southern California and from Oregon to Florida the scenic table is spread for all who would feast on the bounties God has scattered so liberally." Thus John T. Faris, long recognized as an authoritative author on the scenic beauties of America, describes in "Roaming American Playgrounds" the National Parks, the National Forests, the State Parks and the scenic beauties of great regions. Such chapters as "Suppose We Seek Tropical Waters," "Then There Is Hawaii," "Or Even Alaska," "Do You Choose a Dude Ranch?" are certain to start the wanderlust in one's veins and develop a great pride in the scenic beauties of America.—G. H. C.

QUICK WATER AND SMOOTH, by John C. Phillips and Thomas D. Cabot. Stephen Daye Press, Brattleboro. 240 pages. Price, $1.50.

A canoeist's guide to New England rivers—and smaller streams scattered over southwestern Maine, New Hampshire, Massachusetts, Rhode Island and Connecticut. The authors believe that some day canoeing, especially the old sport of running quick water, will come into its own again—and they are doing their share to speed that day on. For their guide is as alluring as it is helpful, and if one yearns for river trips over the week-end, and yet wishes to remain near the back door of Boston; if one has a car, a canoe, a little lunch and this pocket-size book to guide him, a new world of sport is open to him.

The guide will tell you where to start, the distances between bridges and carries, the general character of the water—and the country. It offers a comprehensive and intriguing map to follow, and every river, stream, even many brooks are catalogued for your easy reading.
—E. K.

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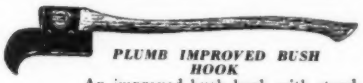

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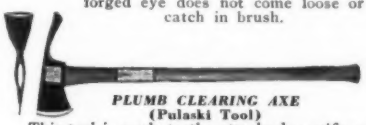

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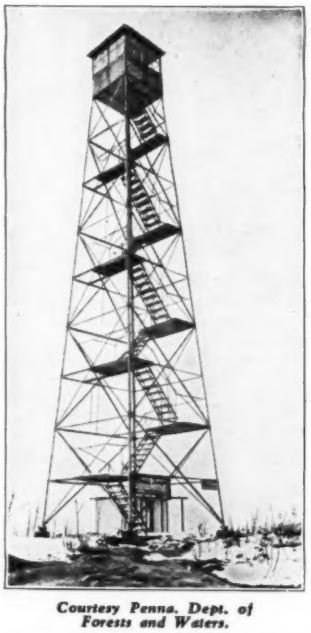

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Conservation Calendar in Congress

Published monthly while Congress is in session as a service to the members of The American Forestry Association. This calendar contains bills introduced in the First Session of the Seventy-fourth Congress between April 15 and May 15, as well as any action taken on bills previously listed.

BILLS APPROVED

H. R. 7054—DEMPSEY—Providing for the "Soil Conservation Service" in the Department of Agriculture to protect land resources against soil erosion. Passed House April 1. Passed Senate April 15. Signed April 27. Public Law No. 46.

H. R. 6718—SANDLIN—Agricultural appropriations bill. Passed House March 15. Passed Senate March 29. House and Senate agreed to Conference Report May 10. Approved.

H. R. 6223—TAYLOR of Colorado—Appropriations for Interior Department. Passed House March 4. Passed Senate April 16. Approved May 9.

NATIONAL FORESTS

S. 376—KING—(H. R. 4339—ROBINSON) Erosion and flood control on lands within exterior boundaries of Uinta and Wasatch National Forest, Utah. Passed Senate May 1.

S. 2695—CAREY—Adding lands to Medicine Bow National Forest, Wyoming. To Public Lands and Surveys April 26.

S. 2694—SCHWELLENBACH—Adding lands to Columbia National Forest in Washington. To Public Lands and Surveys April 26.

H. R. 7657—SAMUEL B. HILL—Adjustment of boundaries of Colville National Forest in Washington. To Public Lands April 22.

S. 2649—HAYDEN—Providing for recreation area within Prescott National Forest, Arizona. To Public Lands and Surveys April 22.

H. R. 7224—GEARHART—Conservation of water resources and encouragement of reforestation of watersheds of Fresno County by withdrawal of certain public lands in Sequoia National Forest in California from location and entry under the mining laws. To Public Lands April 3.

H. R. 7453—PIERCE—Extending provisions of Forest Exchange Act to certain lands so they may become part of Umatilla or Whitman National Forest. To Public Lands April 11.

H. R. 2045—KNUTSON—Withdrawal of lands from Minnesota National Forest Reserve to be reserved as Indian lands for use of Chippewas. Passed Senate May 1.

NATIONAL PARKS

S. 2131—CONNALLY and SHEPPARD—(H. R. 6373—THOMASON) Providing for establishment of Big Bend National Park in Texas. Passed Senate May 1.

S. 2185—McNARY—Accepting the cession by the State of Oregon of exclusive jurisdiction over lands embraced within Crater Lake National Park. Passed Senate May 1.

H. R. 7228—McLAUGHLIN—Establishing Lewis and Clark National Park in Nebraska, and Lewis and Clark Game and Bird Sanctuary in Nebraska and Iowa. To Public Lands April 3.

H. R. 6954—BREWSTER—(S. 1148—WHITE) Transferring Green Lake Fish Cultural Station, Maine, to Acadia National Park. Report 727 April 19.

H. R. 6734—MAVERICK—(S. 2074—BYRD) To create a National Park Trust Fund Board. Report 849 May 9.

H. R. 6670—MAVERICK—(S. 2073—BYRD) Providing for preservation of historical American sites, buildings, objects and antiquities of national significance. Report 848 May 9.

H. R. 7542—TAYLOR of South Carolina—(S. 2716—SMITH) (S. 2671—BYRNES) Establishing Star Fort National Monument and Cemetery in Greenwood County, South Carolina. To Public Lands April 16.

H. R. 7543—TAYLOR of South Carolina—(S. 2641—SMITH) Establishing General Andrew Pickens National Monument in Ocono County, South Carolina. To Public Lands April 16.

WILDLIFE

H. R. 7660—KLEBERG—(H. R. 7632—KLEBERG) (H. R. 7982—KLEBERG) (S. 2332—Senate Committee on Conservation of Wildlife Resources) Amending Migratory Bird Hunting Stamp Act of March 16, 1934, and other acts relating to wildlife administered by the Department of Agriculture, including transfer of the Wind Cave National Game Preserve to the Department of the Interior. To Agriculture April 22

S. 2394—SHEPPARD—Transfer of certain military reservations to departments of the Government including portions of Fort Eustis and Camp Lee to the Department of Justice for migratory bird refuges. Passed Senate April 9.

H. R. 7484—PETERSON—Establishing a fish-cultural station at McIntosh County, Georgia. To Merchant Marine and Fisheries April 12.

STATE FORESTS

H. R. 6914—FULMER—(S. 2739—COPELAND) To authorize cooperation with the several States for the purpose of stimulating the acquisition, development and proper administration and management of State Forests and coordinating Federal and State activities in carrying out a national program of forest-land management. April 12 hearings published. Report 830 May 6.

MISCELLANEOUS

H. Res. 206—McLEAN—Investigation of Tennessee Valley Authority. To Rules April 26.

H. R. 2665—LEWIS—(H. R. 7712—COCHRAN) Changing name of Department of Interior. To Expenditures in Executive Departments April 24.

S. 2583—SMITH—Establishing certain commodity divisions including a Division of Naval Stores in Department of Agriculture. To Agriculture and Forestry April 15.

H. R. 4707—Validating certain applications for and entries of public lands. Report 521 March 28.

S. 654—THOMAS—Exchange of lands reserved for Seminole Indians in Florida. Passed Senate March 29. House Report 738 April 19.

S. 613—THOMAS of Oklahoma—Adding Public Domain lands to Rocky Boy Indian Reservation. Passed Senate March 29. Passed House in lieu of H. R. 3811 May 6.

CONQUERING THE CREST OF THE GREAT SMOKIES

(*Continued from page 262*)

sections that the fire had missed were barren. Trees not large enough to have value at the sawmill had been broken down in the process of lumbering. This process, still called "modern" in many quarters, involves the use of a skidder, in which a strong steel cable is stretched from the top of a ridge, down and across a ravine, and anchored in the side of an opposite ridge. Logs are suspended from this cable and carried down to a logging railroad, breaking down every young tree that had been spared by the cutters. Tree tops and other debris are left scattered over the mountainside; sooner or later fire gets into this. Every living thing perishes in such a fire. Soil-building material is burned; animal as well as plant life is destroyed. Such was the toll taken by the lumbermen on Hell Ridge, and it was that very thing that made this few miles of our trip such a nightmare.

All hail to those who led the successful movement for the establishment of a National Park in the Great Smokies. Under the protection of the National Park Service, even such eye-sores as Hell Ridge will, in time, grow back into a beautiful forest. But, best of all, other areas will be forever saved from such a fate.

Because of the extremely slow progress made on this third day, we did not reach our campsite at the spring under the summit of Mt. Guyot until well after dark. It was a long trek, but we had had enough of Hell Ridge. Our yearning was for the glorious virgin forest that covered so much of the great Smokies.

Badly in need of rest, and tempted by the peaceful beauty of the spot, we lingered at the Mt. Guyot camp Wednesday morning. Such luxury was a real treat for our weary bodies. Then we made the steep, but short, climb to the summit, where the elevation is 6,621 feet. This peak, the second highest in the Great Smokies, was named for Arnold Guyot, who made careful and remarkably accurate elevation measurements of scores of peaks and gaps in the Great Smokies before the Civil War. From our point of vantage we saw much of the 667 square miles in the Park. Clouds obscured most of the surrounding peaks after we had been there an hour, so we resumed our journey, leisurely this time. We were again in familiar territory, and we knew that we had ample time to reach our next camp before dark.

Our route was over what would ordinarily be termed a very poor trail; some would hesitate to call it a trail at all. But in comparison with what we had been through it seemed like a highway. True, we had to crawl through an occasional windfall, and brush from the side switched us at every step, but there was a recognizable path some of the time.

We reached the 6,430-foot summit of Mt. Chapman in time for lunch and were greeted with some of the finest views to be had on the entire state-line crest. The mountain is named for Colonel David C. Chapman, whose ten years of untiring effort brought the establishment of the Great Smoky Mountains National Park.

Suddenly it began to rain, and we stretched our ponchos to keep us dry and warm during lunch. How welcome that rain would have been twenty-four hours earlier! It let up when we reached the crest of Mt. Sequoyah, named for the inventor of the Cherokee alphabet, but the wet underbrush drenched us just as thoroughly.

Before leaving Mt. Sequoyah we checked carefully to be sure that we turned off at the right place. We knew that what appeared to be the main range at the west end, known as Old Troublesome, was only a side ridge dropping off into Tennessee. The state line and water divide turned down the south slope of Sequoyah; and this divide was not apparent until we were almost to Copper Gap. It is one of the most confusing points on the state line. As we climbed the steep ledges leading up from Copper Gap to Eagle Rocks the clouds began to lift, and we could see again some of the grandeur of the surrounding mountains.

Immediately following a rain is the very best time to see the Great Smokies. The characteristic haze, from which the range gets its name, is washed away and the landscapes are much clearer. On Eagle Rocks we were treated to spectacular sights such as only devotees of wilderness trails are privileged to see. Neighboring peaks, peeping above solid banks of white clouds, stood out in bold relief. A riot of color, beggaring any effort to describe, adorned the western sky.

We had planned to go on to the junction of Hughes Ridge and the state-line range, but the surroundings at Eagle Rocks were so pleasing that we could not leave. After finding water wtihin 200 yards of the crest we decided to camp there. It was a real effort to go about such prosaic tasks as pitching tents and hunting dead wood when each of us much preferred to stand on the brink of that overhanging cliff and drink in the glory of the sunset. The situation was made even more tantalizing when one or two members did just that.

To see that red ball of fire sink behind mighty Mt. LeConte was well worth all it had cost us in physical agony to reach Eagle Rocks.

The appropriateness of the name "Eagle Rocks" was readily apparent. There was a sheer drop of hundreds of feet on the Tennessee side. Trees and flowering shrubs grew from every crevice in the rough, irregular walls. It is in such rugged, inaccessible spots throughout the Great Smokies that golden

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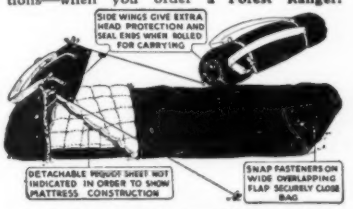
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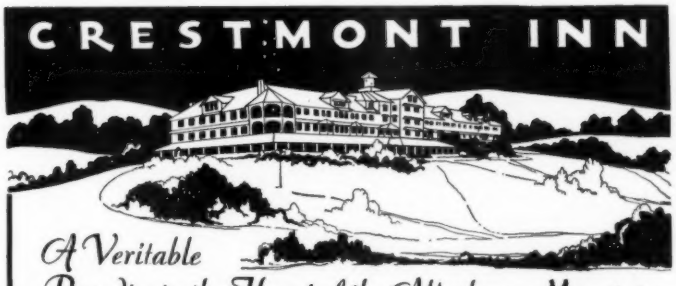

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eagles, northern ravens and that rare and highly prized falcon, the peregrine, or duck hawk, make their homes.

When finally we did get under way we did not fill our canteens, because it was known to hikers that one of the most dependable springs in the Smokies is at the junction of Hughes Ridge and the state-line range, just a mile or so ahead of us. We still had enough to carry without packing water unnecessarily. But, when we reached that point, just before noon, we found that the spring was dry, and we had to go a mile down into North Carolina to find water. After that we took nothing for granted, and always carried water.

Leaving Hughes Ridge, and following the Appalachian Trail markers at a most confusing turn, we entered upon the most jagged, irregular part of the main range of the Great Smokies. Quite appropriately, it is for a distance of ten miles called the Sawtooth Range. We would go down a few hundred feet in elevation only to climb back just as high, or higher, to get over the next "tooth" in that long "saw." At one place our descent was so steep that it was necessary to pitch our packs down ahead of us.

Throughout the next five miles we learned how elusive a mountain peak can be. We were pointing toward Laurel Top, highest of the numerous "teeth" in the range. After passing over six or eight knobs, we began to feel that the next one, which we could occasionally see through the foliage, would be Laurel Top, only to find a higher one still farther along. But the panorama which spread before us when we finally arrived was a suitable reward for the tedious approach. Fifteen separate ranges were visible. Much of the Indian Reservation, which borders the Park on the south, was seen.

Our fifth camp, Thursday night, was at False Gap, about a mile west of Laurel Top. We can never forget that camp, because of the visitors we had there. No, they were not other hikers; I wish they had been. They were "punkies," or "no-see-ums" or tiny black gnats. By whatever name you call them, their bite is just as irritating. The sleep we got that night can be attributed to the special salve we had brought as protection from gnats, or to exhaustion, or both. This was our worst encounter with these pesky insects. Also, we were thankful that there are no mosquitoes in the Smokies.

We were beginning to wish for the waterfalls and for the graceful little cascades which punctuate the 600 miles of turbulent, sparkling streams in the Great Smokies. Four days in the mountains and not a single pool where a rainbow or speckled trout might be seen! There were flowers along our route, to be sure, but they were not in such profusion, nor in such variety, as we had been accustomed to enjoy at other seasons in our frequent ascents of the steep slopes. Yet, it was not altogether a one-sided exchange. While we had missed the waterfalls we had the sweeping panoramas.

We were away early Friday on the first long hike of the trip. We covered more than ten miles that day, over a portion of the Sawtooth Range entirely to our liking as a perfect bit of rugged wilderness. The crest was steep and jagged, with the sides dropping off abruptly below us. Without its forest cover it would have been too severe to be beautiful; but we found a blanket of trees and shrubs growing from a carpet of deep mosses. With low-hanging clouds sweeping about us, and protecting us from the heat of the sun, we made good time. Then, to our amazement, a high ridge appeared before us through a rift in the clouds. What could this be? No such mountain should be at our right.

Suddenly it dawned upon us that we had gotten off the state line and were down on a side ridge in North Carolina. Had such a thing happened on that tortuous Tuesday there would have been no retracing of steps, I am afraid. But here we laughed it off, and turned back up the ridge.

Just before noon, as we neared the end of the much notched range, we came into another, but smaller, fire-devastated area. This fire also had followed closely upon the heels of the lumberman. There are few such sections in the Great Smokies, and only two along the state line. The highest point in this fire-scald bears the quaint appellation "Charlie's Bunion." It is a barren and desolate spot, but the views it offers help to make one forget the ugliness that is more closely about.

We picked Charlie's Bunion for our lunch site. With clouds hanging overhead to protect us from what would otherwise have been a scorching sun, the prospects for a pleasant rest were good. At least, that's what we thought. But before we had finished digging into our packs there were signficant rumblings coming from the direction of Mt. LeConte, the towering and majestic peak on the Tennessee side. Then the storm broke upon us in all its fury.

This was no ordinary rain. It was swept horizontally, and sometimes upward, before a stiff gale. Our only recourse was to get moving, and try to keep moving. There was no keeping dry. With the upward sweep of the rain our ponchos became just so much excess baggage.

Lightning flashed alarmingly close as we stumbled through the maze of fallen tree trunks. Despite the fact that we were chilled to numbness, this was a thrilling experience. The storm subsided as we again reached the virgin forest. Soon we had climbed the last steep grade that leads up to the Jump-Off, described by many as providing the most spectacular view in the Great Smokies. Then we turned our faces to Newfound Gap, our announced destination, three and a half miles away.

There, at an elevation of 5,045 feet, the highest point reached by a public road in eastern America, was a state highway connecting with Gatlinburg, seventeen miles down on the Tennessee side, where headquarters of the Great Smoky Mountains National Park are located. Under construction at this time was a highway to the Cherokee Indian Reservation, the same distance down on the North Carolina side. This road has since been completed and paved, and the National Park Service is now spending $1,250,000 to widen and pave the Tennessee side. These two sections of road combine to make the spectacularly beautiful Newfound Gap Highway, the only one to cross the Great Smokies within the Park. The National Park Service is building another highway—or "sky-way," as it is called, from Newfound Gap westward, approximately along the crest, almost to the summit of Clingman's Dome, at 6,642 feet elevation.

Having reached our announced destination, we were determined to go on, to realize our secret hope of an eighty mile continuous hike. But the temptation of soft beds and fancy food, available at the hotel at Gatlinburg, was great. Faltering members argued that we could return the next morning, after a good night's rest, and continue with the remainder of the trip. Of course we could, but would we? We dared not again become contaminated by civilization—not if the eighty miles of the crestline of the Great Smokies were to be covered in one continuous trip. Thus, with much reluctance we again headed westward for another, but easier, forty miles of hiking.

The climb up across the shoulder of Mt. Mingus, a promontory rising above the state line and jutting out into the Tennessee side, was steep and difficult. But we made it. So did we make the long, steep ascent to Clingman's Dome Saturday morning. This is the highest

point on the Appalachian Trail, as well as highest in the Smokies. We lunched there, waiting hopefully for the clouds to disperse so that we could enjoy the view. But luck was not with us. The clouds remained.

Easier of access and travel, this part of the Smokies is more frequently visited than is the rougher section we had just traversed. We met two groups of men Saturday—a party of five hikers from Bryson City and two Park Service employees clearing trail. About two miles west of the Dome we noted the last of the balsam trees. Here, in the heart of the Southland, is the southernmost habitat of this native to New England and Canada.

On Siler's Bald, whose high, grass-covered summit usually rewards the hiker with superb views, we had only a fleeting glimpse through the shifting, low-hanging clouds. So we continued on to Buckeye Gap, where we spent the seventh night, having achieved twelve miles for the day.

On Thunderhead, 5,530 feet elevation, another treeless "bald," covered partly with grass, we enjoyed a few glimpses down into charming Cades Cove, a long, level valley surrounded by high mountains. By the time we reached the western end of Thunderhead the clouds had cleared and we enjoyed a good rest.

Stretching ourselves out upon the carpet of turf, we sought to solve the age-old mystery surrounding the cause of these "balds." Botanists, apparently, have no explanation for them. But one thing is certain. It is not a tree-line. The higher tree-clad peaks we had just crossed, and the size of the trees which come up to the very edge of the balds, offer conclusive proof of this fact.

Another question over which we speculated was the possibility of a lake having once filled the pastoral appearing Cades Cove. It was certainly an ideal place for one.

It was beginning to look as though an extra day would be needed to complete our trip, unless we elected to travel long into the two remaining nights. This we decided to do and immediately took stock of our rapidly diminishing rations. There was little choice. It was either go on half rations or detour a short distance down from the state line to a herder's cabin for more.

We agreed on the detour. But at the cabin our hope for a change of diet vanished quickly.

"Have you any eggs, or chickens you could sell us?" we inquired.

"Hell, no! I ain't got nuthin' but sow-belly, 'taters and meal," the lanky herder answered in his high-pitched but genial voice. We were glad enough to get a few potatoes, a gallon of coarse corn meal and a pound of fat bacon. And that bacon was fat—not a streak of lean in it! But everything tasted good. We were becoming a part of this "land of do-without."

There was considerable jollification, and some feeble attempts at horseplay as we reached beautiful Ekanetlee Gap, site of our eighth and last camp. Even the rain, to which we had become accustomed, did not bother us.

Hardened by the gruelling work of the past eight days, and with a drizzling rain to urge us on, we made the four miles from Ekanetlee to Gregory Bald on the following morning without a stop, and with almost no fatigue, although our now rain-soaked packs were heavy. Enveloping clouds denied us most of the fine views which hikers have learned to expect from the top of Gregory, so we paused but briefly. Proceeding to Parsons Bald, the last peak at the southwestern end of the Park, we found similar conditions, but were not in such a hurry to leave. The view was veiled, but there were plenty of huckleberries!

Within a half-mile of Deal's Gap, the goal of our nine days' tramping, we missed our route for the second time of the trip. This was due partly, as before, to low-hanging clouds, and partly to an overgrown trail. It did not concern us much, however, for our spirits were rising. We were on the threshold of victory. Insofar as we could learn, we would be the first ever to hike in one continuous trip the whole length of the Great Smokies.

Threats of annihilation had been made against any member of the party who might seek to forge ahead to win the honor of being first to reach Deal's Gap. To prevent such impending violence, we lined up, all abreast, and marched jubilantly and triumphantly down into the highway.

IN PENN'S WOODS

(*Continued from page* 271)

the lessees, and, incidentally, these permanent camp sites of which there are 3,000, bring into the State Treasury about $29,000 yearly in rentals. Foresters and rangers estimate that because of these camp sites nearly a quarter-million people are enabled to spend a vacation at moderate cost in the out-of-doors each year.

Enjoyment of the woods for recreation probably dates from remote antiquity when primitive man first indulged in his most ancient sport—the hunt. And for many centuries hunting and fishing continued to be practically his only forms of forest recreation. Within the memory of living men, however, this narrow conception of it has undergone a change, and today we find people going into the forests, not to camp for a few days or a week, but there to build a cottage and live for months or even the whole year 'round. So completely have new social conceptions entered into our lives that recreation now has values as definite as work.

Being men of vision, the early advocates of State Forests anticipated the present social trend, for from the very beginning of the forestry movement out-door recreation was recognized as a major objective in their administration. In fact, their use for this purpose was recommended several years before a single acre of land was acquired.

How the State Forests are now fulfilling the recreational need for the people of Pennsylvania is exemplified in the development of forest parks and public camp grounds. In Penn's Woods there are now twelve parks, eleven monuments, and fifty-five public camps scattered through the State Forests in twenty counties. The State Forest parks have been created largely because of their natural adaptability for recreational use, their historical associations, and their scenic beauty. In a woodland environment tourists, campers, and picnickers may rest and play amid many rough but comfortable forest conveniences, such as shelters, tables, benches, fireplaces, and nature trails.

Although the State Forest monuments are not maintained primarily for camping and picnicking, they have water and other facilities for the public where meals may be cooked and eaten. These monuments are places made distinctive because of scenic beauty, exceptional geological or botanical interest, or historical associations, and will be preserved for all time in their original primitive conditions. For example, one of the most cherished of them is the birthplace of James Buchanan in Franklin County, the only Pennsylvanian to occupy the White House.

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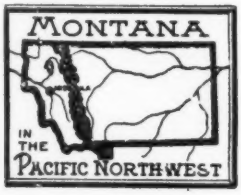

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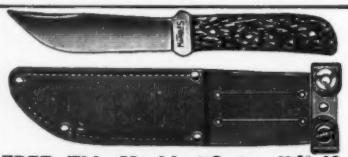
Copies distributed free	959
TOTAL	14,674

Signed, Fred E. Hornaday, Business Manager. Subscribed and sworn before me, May 1, 1935, Josephine M. Nance, Notary Public.



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Perhaps the most popular of the various types of recreational areas, as they are the most important numerically, are the State Forest public camps, places where people may go for an outing of a day or two in the woods and at the same time avoid the crowds that ordinarily are to be found in the larger parks, especially on holidays and over week-ends. These camps, which are equipped with adequate, though not elaborate, comfort facilities, are usually only a few acres in extent. Although there are now fifty-five of them in the State, more are sorely needed, and if the "back to Nature movement" continues, and we have every reason to believe that the annual exodus from town to country is a permanent institution, 200 of these camps will not be too many to meet the needs of the public.

Not alone for rest and play are the State Forests popular. They contain some of the best hunting grounds and fishing waters in Penn's Woods, and have contributed not a little to Pennsylvania's reputation as one of the best stocked game states in the Union. Forty-five game refuges have been established in the State Forests in cooperation with the Board of Game Commissioners, and in these sanctuaries seed stocks live, multiply unmolested, and supply surrounding woodlands with great numbers of game animals and birds.

Estimates place the number of hunters using the State Forests at close to a quarter-million yearly, and the number of fishermen at 100,000. About one-half of all the deer and one-third of all the bear killed in Pennsylvania each fall are taken within their borders, and innumerable quantities of small game, such as rabbits, squirrels, wild turkeys, and grouse, are shot.

Parallel with Pennsylvania's progress in forest fire control and forest recreation has been her promotion of reforestation; she has been one of the earliest and most active of the states in this movement. When the Commonwealth took title to her first purchases of woodlands, hundreds of acres were found to have been so devastated by lumbering and fire that very few timber trees grew on the areas. The quickest and most practical means to restore this land to productivity was by planting trees, and to obtain the trees it was first necessary to establish nurseries wherein to grow them. The first State Forest nursery was established in 1902 at Mont Alto. Now the Department of Forests and Waters operates four nurseries with an annual capacity of ten million trees.

To encourage the reforestation of idle land of which economists estimate there are four million acres, or one-seventh of the State area, trees raised in these nurseries are sold at nominal cost to private land owners. Purchasers of State trees must agree to plant them for timber products and watershed protection only; they may not be used for ornamental purposes or for Christmas trees. During the three decades that the State Forest nurseries have been in operation, the Department has raised and distributed more than 163,000,000 trees.

To administer the State Forests a force of fifty-six foresters and seventy-seven rangers, in addition to other technical and clerical assistants, such as surveyors, typists, and bookkeepers, has been created. The State is divided into twenty-four forest districts, each under the supervision of a technically trained district forester. Some of the districts also have assistant district foresters.

As we have seen, the State Forests were originally created for the greatest benefit and enjoyment of all the citizens of the Commonwealth. The Pennsylvania Forest Service is sticking to that job.

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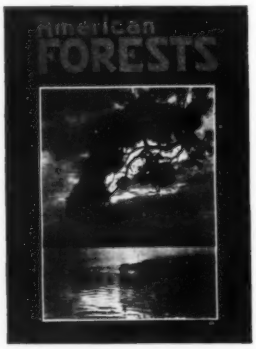

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June, 1935

FIRST WILDERNESS EXPEDITION

(*Continued from page* 278)

Such is the land the first party of Trail Riders of the National Forests will explore in July—a land where one may fulfill the desire for mental repose and spiritual adjustment, where one may renew vitality and vigor.

Inasmuch as the Trail Rider expeditions are conducted by The American Forestry Association, the cost to each rider is based on the actual cost of organizing each trip. For Expedition No. 1, into the Flathead and Sun River Wilderness, the cost is $178, all inclusive, from Chicago back to Chicago. For those who care to motor to Missoula, the cost is $97 from Missoula back to Missoula. The party leaves Chicago on July 6, returning July 22.

For Expedition No. 2, into the Wind River Wilderness, the cost is $182, all inclusive, from Chicago back to Chicago. For the motorist, the cost is $107 from Kemmerer back to Kemmerer. The party leaves Chicago July 28, returning August 12. For Expedition No. 3, into the Gila Wilderness, the cost is $190, all inclusive, from Chicago back to Chicago. For those who motor the cost is $95 from Silver City back to Silver City. The party will leave Chicago on August 18, returning September 2.

Write or wire the Association for further information or for reservations.

THE ENGLISH SPARROW

(*Continued from page* 281)

it has four legs. However, it is not known for great speed, as is well known from the story of the race between the hare and the turtle. Some turtles live to be very old. Certain ones captured on the Galapagos Islands weighed over three hundred pounds, and were probably over four hundred years old.

Turtles are killed and used for food in many places. The tortoise-shell turtle is killed for its shell, known in commerce as "tortoise shell."

The next animal which comes to our mind is the hermit crab. It lives in the water, and has many enemies, so it has formed the habit of living in discarded shells. It twists itself into an empty shell, tail first, and lives in this house until it outgrows it. Then Mr. Crab seeks a new one. When he moves about, he carries the shell with him. It is his chief protection.

Clams, mussels, and oysters also carry their houses with them. Like the snail they secrete their own shells.

The common bagworm, which is a pest on small evergreen trees, drags its silk house behind as it moves on the limbs of trees.

Finally, we have the leaf miner. This caterpillar is found on apple trees, and may be seen boring its way through the leaves of the tree. It cuts a small house out of the leaf, fastening it together with silk threads which it secretes. It leaves a little doorway to the house, and by putting its feet out through this opening, it is able to travel about, carrying its house upon its back.

These are just a few of the creatures which carry their homes with them. In times of danger, drought, or storm, they can find a safe retreat. Perhaps the satisfaction of this security repays them for the arduous work of carrying their heavy houses wherever they go.

SAVING A FAMOUS LANDMARK

(*Continued from page* 272)

ple sage grows in the arrowhead, a darker chaparral covers all surface immediately outside. Neither growth encroaches over the boundary of the other.

During the past years erosion has gradually brought folds and wrinkles to the face of the arrowhead. Hence in keeping with modern surgical science, a face-lifting operation was decided upon by Joe Elliott, supervisor of the San Bernardino National Forest. A particularly deep erosive scar has of late threatened to mar the face of the arrowhead past reclaiming. To allow the arrowhead to become destroyed would be a serious blow to the esthetic and romantic outlook of San Bernardinians. The symbolic and legendary aspect of this natural feature has become knitted into their thoughts and lives.

Sensing all this, Mr. Elliott warned the large community that the elements would obliterate the landmark unless some steps were taken to check the erosion. He aroused great interest. Newspapers gave it publicity, and all were asked to donate funds for its restoration.

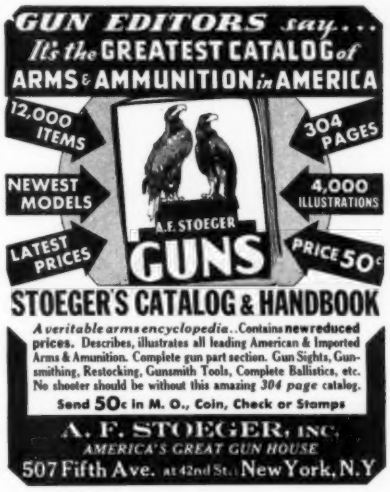
Soon the dollars came trickling in. Tourists, cowboys, miners, school children, business men, clerks, resort managers and the service stations contributed.

More than a thousand dollars was raised, and the work begun. This was a pioneering effort. No one had ever before attempted a face-lifting operation on nature. It required a good deal of study and consultation, and finally it was decided to build a rock and concrete dam, reinforced by railroad iron at the bottom of the deep gully that was gashing the arrowhead's face deeper and wider each year. This was to be a dam not for water, but for the soil higher up.

A trail was first built to the scene of the operation. In keeping with the esthetics of the situation, this trail was constructed zigzagged up and around the mountain out of sight so that here would be no anomalous tail fastened onto the arrowhead. A temporary bridge was built over the gully inside the figure, and the government mules soon brought in the iron rails, cement and rocks.

After the dam was finished and filled in with soil and rocks, a series of smaller, fence-like check dams was built in rows across the gully. The arrowhead being on a steep incline, the men pulled themselves to their work from point to point by means of a rope. Rows of iron pipe posts were driven in across the gully, heavy iron netting stretched along them, and battened down with rock. The gash was then filled in with soil between the check-dams. Barley was sown on his, then wire netting pegged down over the whole, and a quantity of freshly cut brush and sage scattered over it. This, it was expected, would remain in place against the rains and terrific winds that assail the precipitous face of the arrowhead, until vegetative growth had formed its protective foot-hold and healed the scar.

The earliest recorded mention of this seven and a quarter acre landmark is from the diary of Padre Dumetz, in 1810. He wrote: "The valley will be found a one-day march east of here and is easily located by a mark on the mountains forming the north rim of the valley. This mark is in the shape of a large arrow, after the fashion used by the Indians."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ANTS IN THE FOREST

(*Continued from page* 275)

In warm weather they multiply with astounding rapidity. Yet without the care and protection of ants, it is doubtful if certain plant lice could even exist, and all kinds would be very much less numerous. When trees are banded with tanglefoot or some other sticky preparation to keep ants off them, lice are rare or absent on the leaves. Some forms of plant lice (*Lachninae*) pass part of their life history on the roots of plants. It is stated that none of these could successfully transfer themselves from one food source to another with the change in seasons, except for the assistance of ants.

Some recent studies reveal what the millions of ants in some types of forests eat and what they mean to the trees. The investigation was made by carefully weighing ants that were on their way up the trees and then weighing those that were coming down. It was found that the dry weight of the homeward bound ants was just about a milligram greater than those going up the trees. Since the hungry ants on the upward trip weighed only two milligrams on the average, these insects probably rank as the world's biggest eaters, increasing their weight fifty per cent at a meal. Further observations showed that only about one-fifth of the population of an ant colony was occupied in collecting honey dew, but these collectors made five trips a day during an active feeding season of one hundred days a year. An ant heap of average size was found to have a summer population of about 100,000 workers; hence in a year such a colony would collect and consume ten kilograms, or more than twenty-two pounds, dry weight, of sugar, all derived from plant lice. This represents an important quantity of elaborate nourishment taken from the trees.

For a check, the ants visiting certain trees were counted. From this it was reckoned that the ants visiting a single large birch tree would collect in the course of a season more than thirteen pounds dry weight of sugar from the preying aphids. Such a drain on the tree would be considerable, yet it is far from telling the whole story, as all the honey dew secreted by the plant lice is by no means gathered by the ants which climb the trees.

The ant has found some able defenders, however. When the solid food of the red ant was investigated, more than half of it was found to be insects detrimental to the forest, while only a sixth consisted of beneficial forms. It is argued that the restless and constant activity of ants during the season of the year when insect life is at its zenith must account for untold millions of potential pests that might, otherwise unhindered, multiply and give rise to calamities of a serious sort. The entomologists with this viewpoint praise the larger ants as bold predacious insects of the first order, worthy of careful consideration as guardians of the forest, whose operations in general should be counted among the best guarantees of the safety of tree and plant life.

It is impossible to pass infallible judgment on the two foregoing schools of thought with respect to the role of ants in the forest. The writer from unpleasant youthful experience has always been biased against these favorite insects of Solomon and Minerva. In America ants have been charged with the dissemination of the spores of Chestnuut blight and other tree diseases. They are usually most abundant in forests that are thin in crown canopy, growing slowly, and generally unthrifty. Whether this is true because of the ants, or the ants thrive because the trees admit plenty of light, are open questions.

WHO'S WHO

Among the Authors in This Issue

Carlos C. Campbell

CARLOS C. CAMPBELL (*Conquering the Crest of the Great Smokies*) is a charter member of the Smoky Mountains Hiking Club and a member of the Smoky Mountains Conservation Association, the organization which began and successfully concluded the movement to establish the Great Smoky Mountains National Park. He lives in Knoxville, Tennessee.

ALEXANDER SPRUNT, JR. (*Do Eagles Steal Children?*), of Charleston, South Carolina, has been interested in natural history from the time he was a boy, particularly in birds. Following the World War he became Curator of Ornithology for the Charleston Museum. In this connection he had many years of field work in the "low country" which resulted in a great deal of experience with birds of many species. Last summer Mr. Sprunt was employed by the National Park Service as a ranger-naturalist in the Rocky Mountain National Park.

HENRY E. CLEPPER (*In Penn's Woods*) is connected with the Pennsylvania Department of Forests and Waters and is associate editor of the *Journal of Forestry*, the publication of the Society of American Foresters.

T. J. STARKER (*Giant Growers of the Globe*) has been Professor of Forestry, Oregon State College, at Corvallis, since 1922, of which school he is a graduate. He has written numerous articles for technical and popular magazines.

Raymond Wohlrabe

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H. V. BEEKS (*Saving a Famous Landmark*) became interested in forestry at the age of nine when his father, a methodist preacher, took his entire family to the logging camps on the Chippewa River in northern Wisconsin. At present Mr. Beeks is an executive assistant on the headquarters staff of the San Bernardino National Forest, California.

GEORGE S. PERRY (*Ants in the Forest*) is Senior Research Forester of the Pennsylvania Department of Forests and Waters, with headquarters at Mont Alto.

ETHEL ROMIG FULLER (*Poem—And Only Fir Trees Know*) is a well-known poet of the West who lives in Portland, Oregon.

JOHN HARVEY FURBAY (*Field and Forest for Boys and Girls*) is Director of Nature Education, College of Emporia, Kansas. G. H. COLLINGWOOD (*Forestry in Congress*) is Forester for The American Forestry Association.

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ADEQUATE FOREST FIRE PROTECTION by federal, state, and other agencies, individually and in cooperation; the REFORESTATION OF DENUDED LANDS, chiefly valuable for timber production or the protection of streamflow; more extensive PLANTING OF TREES by individuals, companies, municipalities, states, and the federal government; the ELIMINATION OF WASTE in the manufacture and consumption of lumber and forest products; the advancement of SOUND REMEDIAL FOREST LEGISLATION.

The ESTABLISHMENT OF NATIONAL AND STATE FORESTS where local and national interests show them to be desirable; the CONSERVATIVE MANAGEMENT OF PUBLIC AND PRIVATE FORESTS so that they may best serve the permanent needs of our citizens; the development of COMMUNITY FORESTS.

FOREST RECREATION as a growing need in the social development of the nation; the PROTECTION OF FISH AND GAME and other forms of wild life, under sound game laws; the ESTABLISHMENT OF FEDERAL AND STATE GAME PRESERVES and public shooting grounds; STATE AND NATIONAL PARKS and monuments where needed, to protect and perpetuate forest areas and objects of outstanding value; the conservation of America's WILD FLORA and FAUNA.

The EDUCATION OF THE PUBLIC, especially school children, in respect to our forests and our forest needs; a more aggressive policy of RESEARCH AND EDUCATIONAL EXTENSION in the science of forest production, management, and utilization, by the nation, individual states, and agricultural colleges; reforms in present methods of FOREST TAXATION, to the end that timber may be fairly taxed and the growing of timber crops increased.

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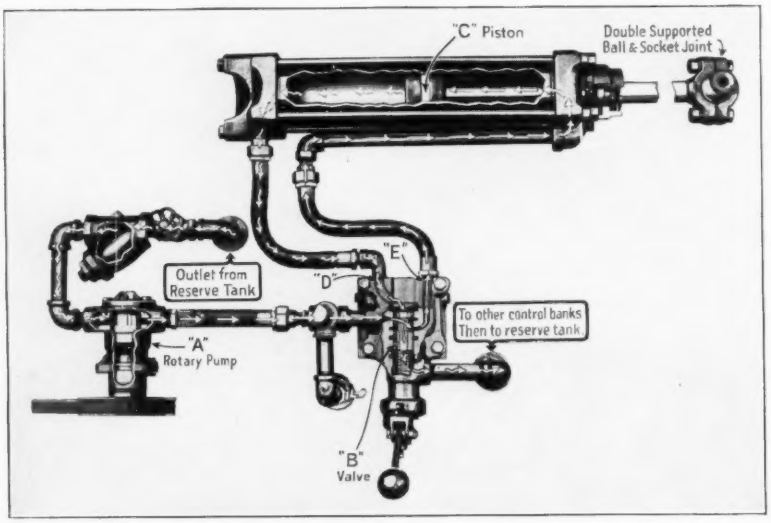

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● Work is done faster and better as the operator's efficiency continues to the end of the day.

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The oil travels from the rotary pump A (note small straight shaft arrows) to sliding shaft B set to divert the oil into the right hand side of the cylinder above causing the piston C to move to the left. This movement forces the oil on the left hand side of the piston to return (follow the wavy arrows) to valve B. This valve may be shifted to reverse the flow of oil or it may be placed in neutral, locking the oil on either side of the piston at D and E. When the flow is stopped at these points a firm wall of oil is confined on each side of piston C holding the piston in a vise-like grip, while the oil from the pump continues to flow freely through the valve returning eventually to the reserve tank.

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